Thunder Bay District Fisheries Management Plan 1986-2000

Draft

Ontario

Ministry of Natural Resources

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PREFACE

Thunder Bay District stretches across nearly 31,000 square kilometres of Northwestern Ontario. Included within the District are over 10,000 inland lakes and 2,350 square kilometres of Lake Superior. The fisheries resources contained within these waters are extremely varied. While not overly productive because of the geology and climate of the area, they do support very active sport and commercial fisheries. Unlike the rest of Northwestern Ontario where non-residents predomindate, residents make up the vast majority of people who angle in the District and most of them live in the City of Thunder Bay. The commercial fishery is based on Lake Superior. Although relatively few people are participants, they harvest large quantities of lake herring and much smaller quantities of other species. Most commercially caught fish are exported but substantial quantities are sold locally, to non-anglers/anglers alike.

Ensuring that the fisheries resources remain healthy and viable so the annual harvests can continue is the responsibility of the Ministry of Natural Resources. Proper planning is a vital part of any effective programme and fisheries management is no exception. In Ontario, a provide-wide plan (Strategic Plan for Ontario Fisheries) was prepared in the mid 1970's. This Plan was one of many brought together in integrated resource management plans in the early 1980's. The Northwestern Ontario Strategic Land Use Plan (SLUP) and the Thunder Bay District Land Use Guidelines (DLUG) are the integrated plans which apply in this area.

The Thunder Bay District Fisheries Management Plan has been prepared based on the content of these superior plans. It is structured to provide the reader with an overview of the fisheries resource base, with a set of general fisheries management strategies and with detailed listings of tactics that will be used to ensure that the management effort is effectively and efficiently directed over the life of the Plan. It also sets out the specific actions that managers intent to undertake over the next 5 years.

This Plan is currently in draft form and you are invited to make any comments you feel are appropriate. They should be directed to:

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Thunder Bay District
Ontario Ministry of Natural Resources
435 South James Street, P. O. Box 5000
Thunder Bay, Ontario
P7C 5G6

The comment period runs until June 15, 1986 after which the public comments, along with the results of the internal review, will be considered in the preparation of the final Plan. The final Plan will be submitted for approval and released to the public some time after the end of June, 1986.

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INTRODUCTION

PURPOSE

The Thunder Bay District Fisheries Management Plan has been prepared as a logical and natural follow-up to the District Land Use Guidelines (D.L.U.G.) which were approved in 1983. The Guidelines established the general direction for the management of all resources in the District, including fisheries, and identified the long term objectives and targets that are to be achieved.

The Fisheries Management Plan identifies the general management strategies and specific fisheries management tactics that will be used to manage the fisheries resources in Thunder Bay District (Figures 1,2) through to the year 2000. The general strategies take into account current fisheries management policy which has undergone extensive development since the preparation of the provincial Strategic Plan for Ontario Fisheries (SPOF) in the mid 70's. Although most strategies confirm existing management direction, several incorporate new initiatives in the fisheries management field. The tactics are much more specific and set out how and where management actions will be undertaken to achieve the stated goal and objectives. The Plan considers the fish populations themselves; the aquatic habitat and adjacent shorelands upon which fish depend; and the varied users of these valuable resources.

Also included within the Plan are management tactics directed at managing the fisheries resources of that portion of Lake Superior which is in the Thunder Bay District. The long term strategies for Lake Superior will be addressed in the Lake Superior Strategic Fisheries Plan which has been prepared concurrently.

For the Thunder Bay District Plan to be successful it must accomplish an additional task. It must clearly communicate to the

Fig.1: Thunder Bay and surrounding Districts of the NORTH CENTRAL REGION.

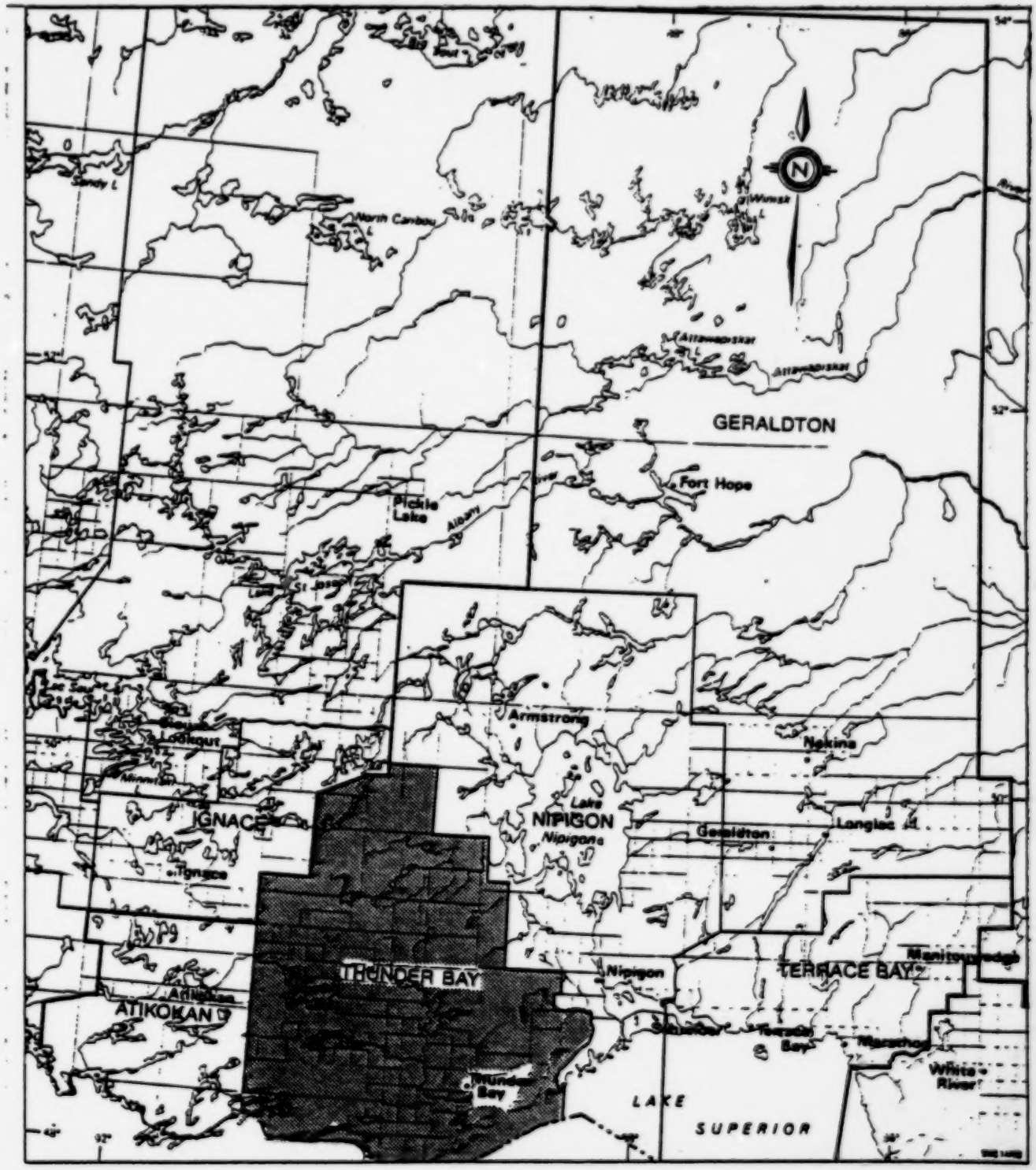
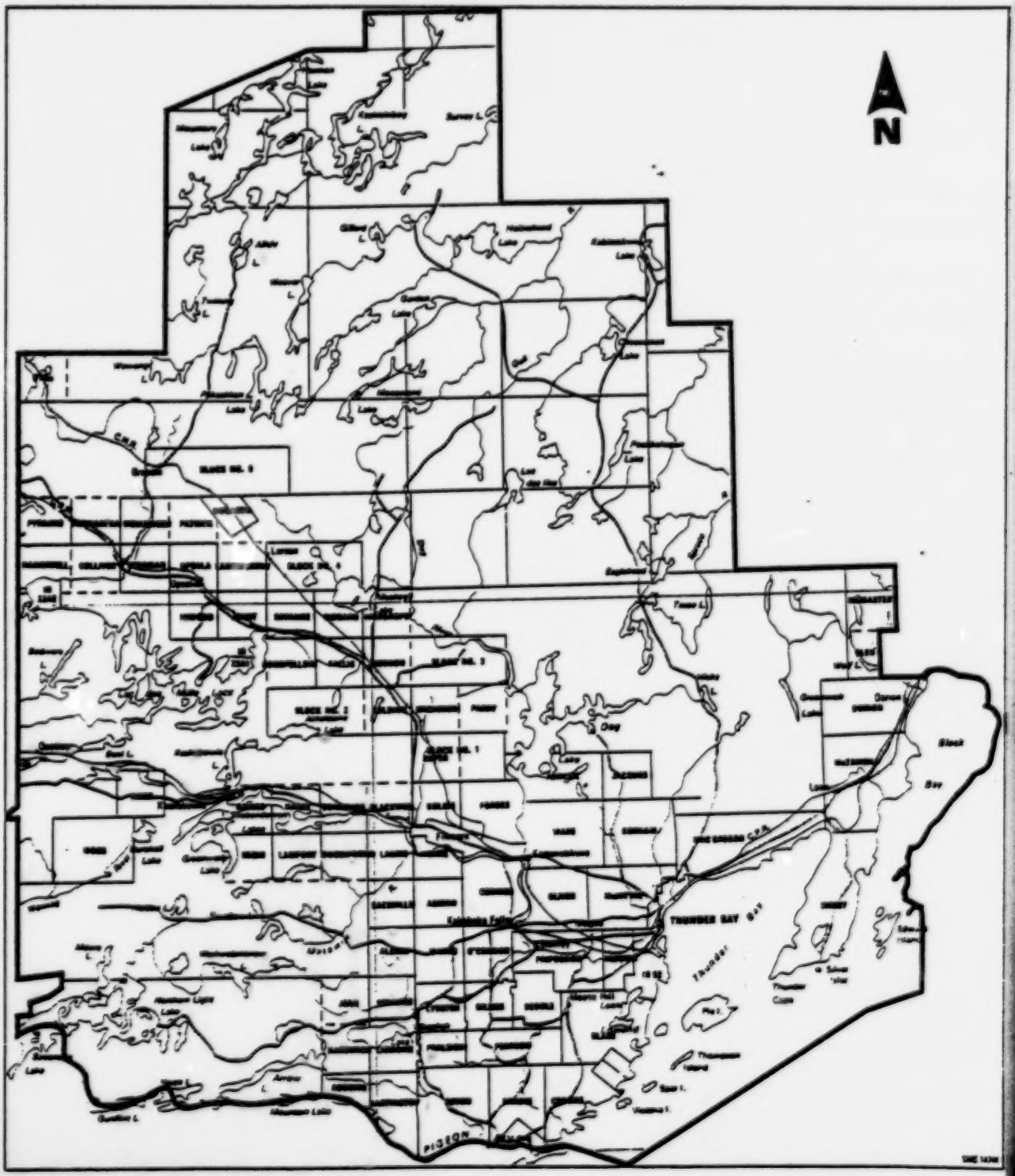


Fig 2: THUNDER BAY DISTRICT



public and to Ministry staff just what will be done to properly manage the fisheries resource. Only if it is rational and understandable can the public comment on or support it. Since the plan should guide fisheries managers for the next decade and a half, it must also provide the basis for annual work programme planning, particularly in the next 5 years.

A single, over-riding philosophy has prevailed throughout the preparation of this plan. It has been that everyone's interests in fish and fishing are best served if the fishery resources are managed to produce the widest possible range of species and fishing experiences. The Thunder Bay area has tremendous potential and diversity in its fisheries resources, the enhancement of which is clearly a management responsibility.

THE PLANNING PROCESS

The steps involved in the process of developing a District Fisheries Management Plan are consistent with those used in other M.N.R. planning initiatives. They include a number of opportunities for public input and review and ensure the preparation of a plan which recognizes public concern.

The development of the Plan entails:

1. a thorough examination of the fisheries resource information base that currently exists;
2. the identification of problems and issues;
3. the development of optional management strategies;
4. evaluation of those strategies both within M.N.R. and by the public;

   - completed by early February 1986.

5. preparation of a draft plan;

   - by mid-May 1986

6. review of the draft plan by the public;

   This step is currently underway.

   - to be completed by mid-June 1986

7. preparation of the final plan;

8. M.N.R. review and approval of the final plan.

9. Release of the approved plan to the public.

DISTRICT FISHERIES PERSPECTIVE

Thunder Bay District is situated on the Precambrian Shield; a region of bedrock and shallow soils greatly influenced by glaciation. A lack of surficial deposits of soil, by influencing the level of dissolved minerals in waterways, lowers the potential productivity of District lakes and streams. Upstream barriers created by glaciation have impeded the inland distribution of native fish species such as walleye and brook trout. Consequently, the natural distribution of those fish species is restricted to only a few watersheds.

Three primary watersheds diverge from within Thunder Bay District directing water to flow east to Lake Superior, west to Lake Winnipeg, and north to James Bay. The influence of three primary watersheds combined with major barriers to fish migration has profoundly affected the natural distribution of fish species throughout the District and consequently affects fisheries management efforts.

There are approximately 10,000 inland lakes with a combined surface area of 248,100 hectares in the Thunder Bay District. An additional 235,400 hectares of Lake Superior are included in the District. As well, an estimated 76 major streams and rivers have a combined surface area of 2,800 hectares.

The inland lakes can be classified as either warm water or cold water, depending on the lake's capability to support salmonid communities. The estimated 200 cold water lakes are further divided into lake trout or brook trout waters with some overlap as a few lakes are presently supporting both species. The warm water lakes support populations of walleye, northern pike, smallmouth bass and yellow perch. Other significant fish species found in District inland waters include lake whitefish, lake herring (cisco), and the common white

sucker. In total, 56 fish species have been identified in the District including 9 species found only in Lake Superior.

The estimated total potential yield of all fish species from productive waters of the District is 1,503,000 kilograms per year based on the estimated productivity of the waters (Table 1). In determining the portion of the estimated potential yield which can actually be harvested, consideration has to be given to what is known about the fish communities and their present status. For inland waters, the allowable harvest is estimated to be 38% lower than the total potential yield primarily due to barren warm water lakes with the capacity to support walleye as well as other under-producing waters (Table 2). For Lake Superior, the allowable harvest exceeds the calculated potential yield by almost three times due to a large exent to commercial harvest quotas based on long term sustainable harvest data. The major quota species harvested in large quantities is lake herring, a species which migrates from a much larger portion of Lake Superior into the District to spawn.

SPORT FISHING

Sport fishing is one of the most significant recreational activities in the Thunder Bay District. Approximately 69,000 anglers (Table 3) harvest an estimated 1.4 million sportfish (excluding smelt) annually. Most resident anglers are local residents residing within the District; while 35% of all anglers are non-residents. Although resident anglers represent only 65% of the total anglers, they account for 78% of the angler-days provided by the District. Thunder Bay District plays a prominent role at a regional level, providing 62% of all the angler-days generated in the North Central Region.

TABLE 1 ESTIMATED TOTAL POTENTIAL YIELDS FROM THUNDER BAY DISTRICT WATERS

	Number	Total Surface Area (ha)	Estimated Total Potential Yield (kg/yr)
INLAND LAKES			
Lake Trout Lakes	96	56,300	141,500
Brook Trout Lakes	104	1,200	3,400
Warmwater Lakes	9,733	190,600	710,900
STREAMS			
Coldwater	53	1,200	4,600
Warmwater	23	1,600	8,600
TOTAL INLAND WATERS		250,900	869,000
LAKE SUPERIOR		235,400	634,000
TOTAL ALL WATERS		485,300	1,503,000

TABLE 2 ALLOWABLE HARVEST BASED ON PRESENT STATUS OF FISH COMMUNITIES

	ALLOWABLE HARVEST BY SPECIES (KG/YR)							
	Lake Trout	Brook Trout	Walleye	Sm. Bass	N. Pike	Whitefish	Other	Total
INLAND LAKES								
Lake Trout Lakes	27,400	1,500	23,300	11,700	25,200	22,700	N/A	111,800
Brook Trout Lakes	N/A	3,400	N/A	N/A	N/A	N/A	N/A	3,400
Warmwater Lakes	N/A	N/A	110,800	11,600	172,800	79,400	46,500 *	421,100
STREAMS								
Coldwater	N/A	1,100	N/A	N/A	N/A	N/A	N/A	1,100
Warmwater	N/A	N/A	2,800	1,500	2,100	N/A	N/A	6,400
TOTAL INLAND WATERS	27,400	6,000	136,900	24,800	200,100	102,100	46,500	543,800
LAKE SUPERIOR	57,000	Neg.	1,800	N/A	6,100	83,800	1,531,600**	1,680,300
TOTAL ALL WATERS	84,400	6,000	138,700	24,800	206,200	185,900	1,578,100	2,224,100

* This figure includes perch from Whitefish Lake (2800 kg/yr) and suckers from larger inland lakes which could be fished commercially

** This figure includes rainbow trout, pacific salmon, lake herring, sturgeon, chub, menominee and suckers

TABLE 3. CURRENT AND PROJECTED NUMBERS OF SPORTFISHERMEN AND ANGLING DEMAND IN THUNDER BAY DISTRICT

	YEAR			
	1980		2000	
	ANGLERS	ANGLER-DAYS	ANGLERS	ANGLER-DAYS
Resident Sportfishermen	44,600	500,000	47,300	530,000
Non-Resident	24,300	142,000	29,300	170,00
TOTALS	68,900	642,000	76,600	700,000*

*This use projection was the basis for the target in the District Land Use Guidelines of supplying 700,000 angler-days in the year 2000.

Walleye are by far the most sought after sportfish in the District for both residents and non-residents, accounting for 59% of the sportfish harvest. Northern pike (14%) and trout species (10%) account for significant portions of the harvest (Figure 3).

The demand for sport fishing opportunities is expected to increase rather significantly for both residents and non-residents to the year 2000. The increase in demand will mean a 9% increase in angler-days from 642,000 presently, to 700,000 by the year 2000 (Table 3).

TOURIST OPERATORS

A total of 50 tourist operators cater to anglers in this District, with operations ranging from remote outpost camps to commercial lodges on the American plan. There are 40 lodges situated on just 13 District lakes, as well as 48 outpost camps on 45 different lakes. Of the non-resident Americans that fish in the District, an estimated 79% utilize tourist operations contributing to an annual three million dollar industry.

Walleye fishing is the mainstay of tourist operators, but northern pike is also important for American clientele. With the projected increase in non-resident anglers, the importance of a healthy tourism industry to meet this demand is obvious.

COMMERCIAL FISHERMEN

An important commercial fishery is well established on Lake Superior, within the Thunder Bay District. Thirty-three licensed commercial fishermen harvested approximately 1,000,000 kilograms (2,200,000 pounds) of fish in 1984 with a wholesale value of $705,000. The largest component (82%) of the commercial harvest is lake herring (Figure 4). At present, approximately 63% of the harvest quotas set for commercial fishermen is being realized on Lake Superior with no anticipated problem in meeting the commercial fishing demand in the near future.

The inland commercial fishery (Shebandowan Lake, Muskeg Lake, Arrow Lake and Lac des Mille Lacs) represents only 1.5% of the District's commercial harvest and is comprised primarily of lake whitefish and suckers.

BAITFISH

Fifty-six baitfish fishermen are currently licensed to trap in the 96 baitfish trapping areas in the District. The reported harvest of approximately 250,000 dozen baitfish are sold annually for a wholesale value of $300,000. The demand for baitfish is expected to increase to around 290,000 dozen baitfish which is considered well within the production capability of District waters.

Figure 3. Breakdown of sportfish harvest by species by all anglers in Thunder Bay District (1980).

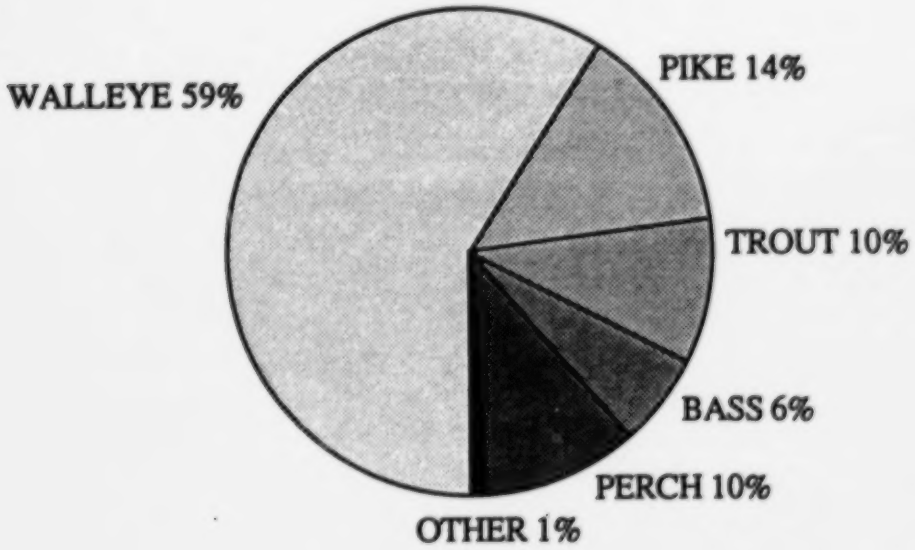
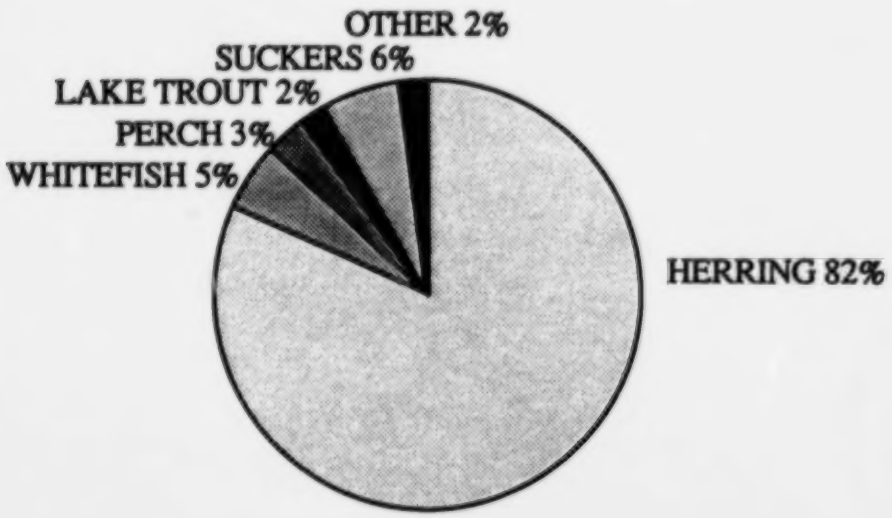


Figure 4. The components of the commercial fish harvest in Black Bay and Thunder Bay of Lake Superior in 1984.



SUPPLY/DEMAND ANALYSIS

The key elements relating to the calculated fish supply and estimates of future demand for fish as outlined in the previous section are brought together in this section.

Allowable Harvest

Sport	484,300 kilograms per year
Commercial	1,739,800 kilograms per year

These data are from Table 2 and display the separation of total allowable harvest into sport and commercial components.

Current Use

Sport	642,000 angler-days
Commercial	980,000 kilograms harvested (1984)

At present there are no estimates of the total harvest in kilograms resulting from the sport fishery. The commercial harvest figures are from legally required reports.

Projected Use

Sport	700,000 angler-days
Commercial	1,666,000 kilograms harvested

The projected demand for angling would result in 700,000 kilograms of fish harvested if the expected quality standard of 1 kilogram harvested per angler-day is achieved. The figure for commercial use is a reflection of current quotas and assumes full utilization by the commercial fishery.

D.L.U.G. Targets

Sport	700,000 angler-days/7000,000 kilograms harvested
Commercial	1,601,000 kilograms harvested

The D.L.U.G. target for sport fishing is the same as the projected use. The commercial target reflects the quotas as they existed in 1983 when the District Land Use Guidelines were developed.

When these numbers are compared major differences are noted in 2 areas - allowable harvest versus D.L.U.G. target for the sport fishery and current use versus projected use in the commercial fishery.

The allowable sport harvest for the District (484,300 kilograms) is currently well below the projected D.L.U.G. target of 700,000 kilograms by the year 2000. In consideration that all our estimates are subject to significant sampling error, it is our position that by utilizing sound management practices resulting from the implementation of the plan, it will be possible to meet the sport harvest target. **However, it is obviously imperative that all fish stocks and waters capable of producing fish in the District must be managed to their fullest potential.**

Regarding the figures for the commercial fishery, the difference between current use and the allowable harvest is primarily due to harvest of lake herring being much below that allowed by the quotas. The harvest of lake herring has always been very dependant on fall weather conditions and the market demand. Since the commercial fishery is under much more intense assessment than is presently possible with the sport fishery, proper management should ensure the long term viability of commercial fish stocks.

GOAL AND OBJECTIVES

Goal

The goal of managing the fish populations of Thunder Bay District is:

To protect and maintain, and where possible, rehabilitate and enhance the desirable fish communities of Thunder Bay District and the habitat on which they depend to provide an optimum contribution of fish, fishing opportunities and associated benefits to all members of society.

Obviously the focus will be on those desirable fish communities that can contribute benefits to society. To attain these recreational and commercial benefits, fish communities, which are healthy and producing at optimal levels, must be managed to ensure they continue to do so. Where degradation has occurred, whether the cause is overfishing, habitat deterioration or a change in the fish community, rehabilitation is needed to restore the health of the community so that its potential production can be achieved.

Benefits from good management will accrue not only to anglers and commercial fishermen, but to associated interests as well. Businesses which supply tackle, bait, boats and motors and accommodations to anglers all depend on good fish populations. People who do not angle, but enjoy eating fish, are served by a viable commercial fishery.

Objectives

The attainment of the goal depends on fulfilling a number of objectives which provide a clearer picture of the components which must be addressed in the overall management programme. The first five

incorporate the objectives and targets for fisheries management as outlined in the District Land Use Guidelines. The balance have been developed in recognition of the fisheries management needs and opportunities which were identified during the detailed review of the background information.

1. To meet the anticipated demand for sport fishing, within the limits of the potential yield capacity, in the year 2000 of 700,000 angler-days at an angler satisfaction level of 1 kilogram per angler-day.
2. To provide for commercial fishing consistent with other users of the resource in order to maintain, under a quota system, the District's annual harvest of 1,601,000 kilograms.
3. To implement the Lake Superior Strategic Fisheries Plan through the Thunder Bay Fisheries Management Plan in order to meet the 1,515,000 kilograms annual commercial fish target from Lake Superior and to contribute to the District's sportfishing target.
4. To maintain the present level of harvest of baitfish and promote full utilization of the resource.
5. To management the District's lake trout populations in order to yield 0.25 to 0.75 kilograms per hectare per year.

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6. To evaluate planned uses of water and associated land to ensure compliance with laws governing these uses; to reduce conflicting uses of the environment; to ensure negative impacts are minimized; and mitigation practices are effective.

7. To restore or rehabilitate degraded fish communities to a self-sustaining level by habitat improvement, manipulation of fish populations and/or controlling utilization.
8. To enforce current fisheries regulations consistently, equitably and effectively in order to protect and perpetuate fish populations.
9. To encourage public awareness of the issues involved in fisheries management through public involvement in management decision-making and public education programmes.
10. To identify areas where sport fishing opportunities would be available to meet the needs of residents and non-residents through commercial tourism establishments.
11. To identify waterways with significant fish communities and/or complex user issues for which specific fisheries management plans will be developed.
12. To utilize opportunities to provide innovative or high quality fishing experiences to the public.

MANAGEMENT DIRECTION

In the development of this management plan a great deal of weight has been given to previous planning documents and to the active, well established management practices which have served both fisheries managers and the public so well in the past.

In the 1970's, Fisheries Branch of this Ministry in conjunction with the Department of Fisheries and Oceans of the Government of Canada developed the Strategic Plan for Ontario Fisheries (SPOF). This very broad, far-reaching plan set down the basic principles to guide fisheries management across Ontario into the twenty-first century.

The Strategic Land Use Plan for Northwestern Ontario and the District Land Use Guidelines were prepared to ensure all the resource management programmes of the Ministry are well integrated to minimize conflict between programmes and to make the most efficient and effective use of management effort. A comprehensive background report has been prepared cataloguing the fisheries resource information that has accumulated in files and reports. Based on this background information and giving appropriate regard to the superior plans mentioned above, a report entitled "A Summary of Background Information and Optional Management Strategies" was prepared and made public in December 1985. That report was prepared to be the basis of public input to this management plan. The summary of the public comment is in Appendix I.

In the "Summary", management strategies were presented dealing with a number of routine management activities, with some identified enhanced management opportunities and with optional ways of resolving the 8 general problems and issues that emerged from the analysis of the background information.

After reviewing the public input and reconsidering the structure and general direction this plan has been taking, it became apparent that the purposes of the plan would not be served without some modification to the management directives section. It was felt the enhanced management opportunities could be better dealt with by incorporating them into strategies and tactics developed to deal with other concerns.

It was also apparent that the management strategies for some very important fishes were not well presented and the direction that was intended was too obscure.

The result of discussions on these points is that the strategies and tactics which make up the core of this management plan are grouped in 3 categories.

A. ROUTINE MANAGEMENT STRATEGIES

I	Law Enforcement
II	Habitat Protection
III	Licencing
IV	Commercial Quota Setting
V	Public Information

B. SPECIES RELATED MANAGEMENT STRATEGIES

VI	Walleye Management
VII	Lake Trout Management
VIII	Brook Trout Management
IX	Baitfish Management

C. PROBLEMS AND ISSUES RELATED STRATEGIES

X	Underproducing Waters
XI	Underutilized Species
XII	Lake Specific Management Plans
XIII	Competition Between User Groups
XIV	Overharvest of Fish Stocks
XV	Inadequate Information
XVI	Deterioration of Habitat
XVII	Introduction of Undesirable Species

For each of these concerns there is a brief discussion which serves to put the matter in perspective within the context of fisheries management in Thunder Bay District. The general strategy that will be used is set out and then the specific tactics that will be employed in support of the strategy are outlined. In some cases the tactics are alternatives that will be used depending on the exact circumstances while in other cases they are intended to be sequential in nature.

A. ROUTINE MANAGEMENT STRATEGIES

The management of fisheries in the District begins at the level of day-to-day routine activities for which there are strong obligations imposed by law or significant public demand. Routine management activities will continue to be important on a regular basis and are considered essential in delivering our mandate to manage fisheries.

I LAW ENFORCEMENT

Discussion

The use of laws and their enforcement as a fisheries management tool dates back to medieval England. In Ontario, law enforcement is recognized as a primary management tool necessary to ensure compliance with acts and regulations governing people's use of our fisheries resources.

In Thunder Bay District, seven conservation officers, a conservation officer co-ordinator and a number of deputy conservation officers undertake law enforcement activities associated with both recreational and commercial use of fish populations. The primary enforcement activity involves routine checks of anglers for compliance with open seasons, catch limits, and required licences (presently non-residents only). An increased effort is also being put into the monitoring of commercial fisheries to ensure compliance with commercial catch quotas instituted in 1984 under the M.N.R. programme to modernize the commercial fishing industry in Ontario. Fisheries habitat protection laws are also enforced by District conservation officers.

Strategies

The general strategy concerning law enforcement will be to efficiently and effectively undertake law enforcement activities relative to recreational and commercial fisheries which will achieve an acceptable level of compliance with laws and regulations governing the uses of the fisheries resources.

Tactics

- undertake routine patrols and angler checks to maintain public awareness of the presence of law enforcement personnel
- incidences of market poaching (illegal sales of fish) will result in vigorous investigation and prosecution
- fisheries related enforcement problems will be identified and means for their resolution presented in a District enforcement plan
- educate the public about the necessity to report observed fishing violations as soon as possible
- monitor commercial fishermen for compliance with terms and conditions of their licences and catch quotas
- ensure important sportfish species are protected from illegal harvest during vulnerable periods, eg. spawning

II HABITAT PROTECTION

Discussion

The ability of any fish species to sustain itself is dependant on the existence of suitable habitats for spawning, rearing, etc. The protection and maintenance of these important fish habitats is necessary if the objectives of fisheries management in Thunder Bay District are to be achieved. The Federal Fisheries Act provides the

legal authority for Ministry staff to review all planned activities of individuals, companies or agencies that do work in or near water. Section 31(1) states that "no person shall carry on any work or undertaking that results in the harmful alteration, disruption or destruction of fish habitat".

Plans concerning forest management activities are examined in detail by biologists and the fisheries management officer to ensure that operations close to waterbodies do not threaten fish habitat and if they do, modifications to the operations are implemented for habitat protection. Additional plans, such as those dealing with mining activity, utility corridors, power generation, industrial and private development, cottaging and municipal plans are also carefully scrutinized.

Strategies

The general strategy will be to ensure that all plans involving development or resource extraction close to waterbodies are examined carefully for potential impacts on fish habitat and that modifications be implemented to mitigate any potentially detrimental effects. Those agencies/companies who often work close to waterbodies should be made aware of possible constraints on their proposed operations to maintain and protect fish habitat before development/resource extraction plans are submitted for approval.

Tactics

- use provisions of the Fisheries Act and joint Federal/Provincial procedures to require a proper environmental review prior to supporting the authorization of any activity causing harmful alteration, disruption or destruction of fish habitat

- ensure that the Thunder Bay District Fisheries Management Plan receives circulation among branches of the M.N.R. (eg. Forest Management and Lands) and outside agencies which can be directly affected by the objectives of this Plan
- ensure that the Fisheries Plan is presented to representatives of forest harvesting companies working within the District, outlining areas where normal forest harvesting activities or road building activities may be affected, given the objectives of the Plan
- ensure that all members of the Timber Management Planning Team established by the District Manager are aware of fisheries management concerns in the operating plan areas
- ensure that all forest harvesting companies (particularly camp foresters) have a copy of the M.N.R. publication "Guidelines for the Protection of Fish Habitat"
- utilize the District Communications Plan to seek opportunities to inform the public of the need to protect habitat
- promote habitat protection and rehabilitation through co-operative management with fish and game clubs and other concerned groups

III LICENCING

Discussion

All users of the fisheries resource, other than resident sportfishermen, presently require licences. The issuance of licences to commercial (food) fishermen and baitfish harvesters allows some measure of control over commercial resource utilization.

Strategy

The general strategy will be to continue licencing non-resident anglers and all commercial users of the fisheries resource as required by law and in accordance with Ministry policy and procedures. (A proposed angling licence for residents may be initiated in 1987.)

Tactics

- licences for commercial (food) fishermen and baitfish harvesters operating within Thunder Bay District will continue to be issued through the M.N.R. Thunder Bay District office
- licences for sportfishing will continue to be sold through the Thunder Bay District office and outside issuers
- ensure sufficient licence issuing outlets exist to enable sportfishermen to acquire licence without undue inconvenience

IV COMMERCIAL QUOTA SETTING

Discussion

Commercial fishing in Thunder Bay District occurs primarily on Lake Superior (98.5%) with a small component coming from inland waters (1.5%). Thirty-three licenced commercial fishermen harvested approximately 1,000,000 kilograms of fish in 1984, approximately 97% of which were fish species for which individual quotas have been set.

Since 1984, with the introduction of a programme by the Ministry of Natural Resources to modernize the commercial fishing industry, individual commercial fishermen have been assigned maximum allowable harvest limits (quotas) for most commercial food fish species. The objective of quota setting is to ensure a viable commercial fishery while maintaining self-sustaining fish populations at or above their present levels. Quotas are set for individual commercial fishermen by Thunder Bay District in consultation with the Lake Superior Fisheries Management Committee after assessment of fish stock levels is provided by the Lake Superior Fisheries Unit. As well, the local commercial fishermen's association is involved in discussions concerning the adjustment and allocation of quotas.

The D.L.U.G. target for Thunder Bay District is to provide for an annual harvest of 1,601,000 kilograms (quota and non-quota species) of commercial (food) fish by the year 2000. Currently the harvest of fish species under quota (1984 - approximately 1,000,000 kilograms) is 35% below the combined quotas (1,535,910 kilograms) available for commercial harvest. The commercial harvest of non-quota species in 1984 was approximately 75,000 kilograms.

There is no anticipated problem in meeting the commercial fishing

D.L.U.G. target in the year 2000. No new licences are being considered on Lake Superior and the relatively low level of utilization of available quotas on Lake Superior and inland waters, plus the availability of species with no quotas, indicated the target harvest should be achievable.

Strategy

The general strategy will be to continue to make allocations from the total allowable harvest by means of quotas to the licenced commercial fishermen, primarily on Lake Superior. Quotas will be refined to reflect changes in population levels while ensuring that the harvest is maintained at sustainable levels.

Tactics

- the Lake Superior Fisheries Unit will continue to collect and analyze data on Lake Superior fish populations and liaise with the Lake Superior Fisheries Management Committee and the District concerning the status of fish stocks and quota setting
- the local commercial fishermen's association will continue to be involved in the process of quota adjustments and allocation

V PUBLIC INFORMATION

Discussion

The provision of information to the public involves inquiries taken over the telephone, in writing or in person. Since 85% of the adult anglers who reside in the North Central Region live in Thunder Bay District, the number of inquiries they generate amounts to a substantial workload for District staff. Questions regarding open seasons, catch limits, places to fish, and fishing techniques are regularly received. Many talks, slide shows, and film presentations are made to user groups including school classes, clubs, associations, and special functions. It is anticipated that the demand for these services will increase as greater numbers of anglers gain more leisure time to pursue their sport.

Strategy

To meet the public demand for information it will be routine practice to ensure that knowledgeable staff are available at the Thunder Bay District Office on a day-to-day basis and that all requests for formal presentations that involve public education are properly handled.

Tactics

- ensure that the most knowledgeable available person is given telephone inquiries
- ensure that written requests for information are answered within five working days of receipt by the most qualified person
- ensure that the public is made aware of information available at the District Office concerning the district fisheries resource

- develop the skills of all fisheries staff to ensure that high quality public presentations can be organized and given as required

B. SPECIES RELATED MANAGEMENT STRATEGIES

Four species related strategies have been developed. Walleye, lake trout and brook trout are the species of most interest to anglers in the District and have received significant management effort over the years.

Walleye is by far the most popular sportfish in the District and while much has already been accomplished, much more remains to be done if the potential of this species is to be realized. Lake trout have received considerable attention in the recent past and the strategy and tactics for managing this species are well entrenched. Brook trout have been commanding more attention from anglers in the past few years because of the steps taken to manage lake trout but there is potential to achieve even better results if innovative ideas are implemented.

Although baitfish collectively represent many species, for management purposes they are treated as a single group and can appropriately be considered on a District-wide basis along with the three species above. Management of this resource is particularly difficult because so little is known about it and most management activities are administrative in nature.

VI WALLEYE MANAGEMENT

Discussion

The walleye (yellow pickerel) is the primary sport fish of the District. It is pursued and harvested by more anglers than all other species combined. It is preferred by all user groups whether they are local, non-local, non-residents, day trippers, campers or users of tourist facilities.

If the District is to achieve its objectives for the fishery programme, the walleye must be given priority and actively managed. It is impossible to fully manage other species without having programmes to satisfy the needs of the walleye fishery.

Prior to 1900 walleye populations occupied only a small part of the District, the north (Lac des Mille Lacs to Graham) and some lakes of the Nipigon-Superior drainage systems.

Introductions and migration have expanded their range.

1900 - Saganaga/Northern Light Lakes area

1940's - Crayfish, Kashabowie, Shebandowan, Whitefish Lakes

1960-70's - Boreal, west of Whitefish Lake, Spruce River Road Areas

1980's - Dog Lake watershed (on-going)

The District's waters have the potential to produce about 136,900 kilograms (300,000 pounds) of walleye annually. Recent introductions to 10 lakes and 3 rivers should increase the walleye producing waters by approximately 9,000 hectares and production of walleye by 12,000 kilograms (26,400 pounds). Subsequent migration to Dog Lake and other lakes will have considerable positive impacts as well.

Seventeen lakes have been identified for probable introductions in the near future. Seven have had aquatic surveys completed and 10 are scheduled to be surveyed over the next few years. These lakes have a combined area of 12,300 hectares and a potential production of

16,000 kilograms (35,200 pounds) of walleye annually. Looking into the future 46 additional lakes have been identified for consideration to become part of the walleye introduction programme.

Strategy

Meet the anticipated demand for walleye angling and harvest opportunities by implementing effective and innovative management initiatives in addition to routine enforcement and habitat protection activities. Implement research and assessment to increase knowledge about walleye and the status of populations. These efforts will allow for the maintenance of healthy populations, restoration of those already depleted and for expansion of its range through introductions into suitable waters.

Tactics

- ensure protection of the breeding segment of walleye populations when they are concentrated prior to and following spawning (Shebandowan Lake has 4 such locations now closed to walleye angling from April 1st to June 1st)
- implement innovative harvest regulations to effect the establishment of trophy fisheries (lakes to be evaluated for possible trophy walleye status include Cloud, Sandstone, Saganaga and Arrow)
- increase the effectiveness of enforcement activities directed at curtailing the poaching of spawning walleye
- continue to actively enforce creel limits to prevent overharvest and maintain healthy walleye populations
- emphasize the protection of critical spawning and nursery habitat through routine habitat protection measures
- increase new knowledge about walleye by supporting and co-operating with the research and assessement activities of:

- Walleye Research Unit
- Fisheries Productivity Research Unit
- Quetico-Mille Lacs Fisheries Assessment Unit
- Lake Superior Fisheries Unit
- Lakehead University Biology Department

- expand the range of walleye through planned introductions of adults to lakes with suitable habitat as identified in Appendix II.

VII LAKE TROUT MANAGEMENT (INLAND WATERS)

Discussion

Relatively few (less than 1%) of the lakes in Thunder Bay District are known to contain lake trout and in only about 75% of these are lake trout a major component of the fish community. In D.L.U.G. these were defined as "prime" lake trout lakes (Appendix 3) and the intent is to manage them to yield .25 to .75 kilograms per hectare per year. The majority of these lakes are distributed through the southern half of the District and most are within or very near the Lake Superior watershed.

Strategy

The District strategy for managing lake trout is to ensure the continuation of optimum self-sustaining populations in prime lakes by maintaining natural habitats and by controlling exploitation to maintain abundant populations and rehabilitate depressed ones. Efforts will also be made to halt the introduction of species which can negatively affect lake trout communities. In non-prime lakes the presence of lake trout will be recognized but their presence will not necessarily dictate the management strategy.

Tactics

- ensure routine activities directed at maintaining fish habitat emphasize the protection of lake trout habitat
- discourage any further disposition of Crown land on lake trout lakes for cottaging, lodge development, etc.
- apply season adjustments to maintain harvests within self-sustainable levels in lakes with good populations
- in lakes with depressed populations, the emphasis will be on

maintaining those resident stocks which are genetically attuned to their environment by significantly constraining harvest thereby allowing those populations to rebuild naturally

The preceeding 2 tactics are manifested in the present season restrictions which were implemented in 1984 after considerable public review and discussion. Generally a one month winter season and a summer season running from June 1st to September 30th provide some winter and summer fishing but protect lake trout when they are most vulnerable to angling. In a few small lakes with very vulnerable populations, no winter fishing is allowed.

Additional Tactics

- undertake surveys in the following selected lakes to monitor the effects of the season adjustments initiated in 1984
  - Abigogami
  - Burchell
  - Fallingsnow
  - Greenwater
  - Huronian
  - Innes
  - Oliver
  - Rudge
  - Wolotka
- maintain the present mix of accessed and unaccessed lake trout lakes by discouraging the creation of new access to lake trout lakes through careful road planning and removal of unauthorized access facilities
- where vehicular access is presently provided, any additional access must carefully consider the effect on lake trout populations and the quality of the angling experience

- work with Minnesota counterparts to co-ordinate harvest strategies and regulations applied to border lake trout waters
- continue to support the research and assessment efforts of the Quetico-Mille Lacs Fisheries Assessment Unit and Lakehead University Biology Department concerning the management of lake trout in key lakes in the District (Squeers, Greenwater)

VIII BROOK TROUT MANAGEMENT

Discussion

Brook trout occur naturally only in watersheds that drain to Lake Superior and then normally only upstream to the first natural barrier. They sustain themselves in at least 1,250 kilometres of stream but only in a handful of lakes. Proper spawning habitat is very limited or non-existent in most lakes. Numerous small brook trout streams in the near-urban and agricultural areas of the District have been seriously degraded by adjacent land clearing activities and related land use practices.

Stocking has been the principle management activity and is responsible for maintaining most lake populations. At one time as many as 375 lakes were on the District's stocking list. Improved habitat evaluation methods, emergence of yellow perch as the dominant species, prohibitions on public access and nature reserve policies prohibiting stocking have combined to reduce this list to 94 lakes which are now regularly stocked although not all are stocked every year (Appendix IV). Some stocking has also occurred to establish new, self-sustaining populations in rivers that surveys have indicated are suitable for brook trout. In an average year, about 10 lakes are stocked with a total of 25,000 yearlings and 30 to 40 lakes and 2 streams are stocked with up to 175,000 brook trout fry.

Because the stocked fish are genetically able to grow large (Lake Nipigon strain) and some of the local lakes provide excellent forage, each year numerous large (>2.3 kilograms) brook trout are caught in District lakes. There is the potential to increase the frequency that fish of this size are caught.

Brook trout is a species traditionally highly prized by fly-fishermen and since some populations (especially in rivers) may be overlooked by other anglers, there is also the potential to provide some areas where fly-fishermen can focus their activities.

Although some populations may not be being fished to their potential, some stocked, road accessible waters are subjected to substantial pressure for 9 months of the year. Other potentially quality fisheries are subjected to heavy pressure during the winter resulting in poor success among open water anglers. In fact, few lakes are known to support quality spring and summer fisheries.

Strategy

The District strategy for managing brook trout is to maintain and enhance opportunities for brook trout angling in the District by ensuring suitable waters continue to be stocked, increasing the range through introductions to suitable rivers, rehabilitating deteriorated stream habitats, and pursuing opportunities to supply a broad spectrum of angling experiences.

Tactics

- efficiently and effectively stock both yearling and fry brook trout in accordance with provincial policy; yearling fish are stocked in lakes with good road access and fry are stocked in the more remote lakes or those with poor road access as well as for introduction purposes
- assess the merits of new stocking methods and monitor the success of introductions
- provide public notice of the stocking programme through provision of stocking lists
- undertake stream surveys to identify new waters suitable for introductions

- involve organized sportsmen and landowners in habitat rehabilitation projects supported by the Community Fisheries Involvement Programme (CFIP)
- investigate the establishment of regulations to increase the chances of catching trophy-sized brook trout in selected lakes (candidates include Unknown and Pennassen Lakes)
- investigate the establishment of selected waters where fly-fishing is the only allowable angling technique
- provide improved spring and summer angling quality in selected lakes through winter season restrictions or closures

IX BAITFISH MANAGEMENT

Discussion

Presently the management of baitfish is restricted to licencing baitfishermen and dealers in accordance with a policy adopted for Northern Ontario in 1978. The harvest licences grant exclusive authority to the licensee to catch baitfish in a geographic area of the District. All licenced fishermen (100) also hold dealer's licences which allow them to retail their catch to anglers. There are also numerous people who are only dealers (25). They must purchase their supply from licenced fishermen.

Because of insufficient scientific knowledge about the productivity of baitfish populations, no quotas are applied to the harvest licences. However, there is an implied obligation to actively utilize the resource in the licenced area.

Concerns about the management of baitfish fall into these areas:

- lack of information about the status of the baitfish resource and its ability to sustain the present or future levels of harvest
- perceived underutilization of the licenced area by some licensees
- demand for additional harvest licences, from people holding only dealer's licences and from present baitfish harvesters who wish to expand
- inability of the industry to meet angler demand at certain times of the year due to seasonal fluctuations in supply

Most of these concerns are related to the administration of the industry and resolving them will require the co-operation of the participants.

Strategy

Stimulate the development of a local baitfishermen's association and jointly develop improved administrative practices and baitfish management procedures.

Tactics

- develop a library of information concerning baitfish
- conduct baitfish management workshops to bring harvesters together and share information
- initiate discussions within the industry to develop modern administrative practices
- encourage and support the formation of a local baitfishermen's association

PROBLEMS AND ISSUES RELATED STRATEGIES

The strategies and tactics outlined in this section deal with the 8 general problems and issues which emerged from an analysis of a detailed listing of all the fisheries management concerns in the District. The specific tactics that have been listed include some which overlap with some of those identified in the preceding sections but are included for the sake of completeness.

X UNDERPRODUCING WATERS

Discussion

The D.L.U.G. target concerning sportsfishing in Thunder Bay District is to provide for 700,000 angler-days at an angler satisfaction level of 1 kilogram per angler-day. This translates to 700,000 kilograms of fish per year. Thunder Bay District's most recent (1980) estimate of demand was 642,000 angler-days per year. Although populaton growth in Thunder Bay District has been slow over the last 15 years and is projected to continue at a slow pace, the District will have to encourage optimum utilization of all existing fish resources (see Underutilized Species Strategy, page 46) as well as take steps to increase populations of desirable fish species to help meet the demand in the year 2000.

A significant number of District waterbodies, both lakes and rivers, by nature of their resident fish communities, are considered to be underproducing waters. In most cases, they are small to medium sized lakes containing only northern pike as a top predator. Walleye, the species most preferred by anglers in this District, are not naturally present in many of these "pike" lakes because of the post-glacial distribution of the species. Many of these lakes are judged to be capable of supporting walleye as an addition to the present fish community, thereby expanding their range and increasing walleye fishing opportunities in the District. Most of the lakes being considered for introductions are situated in the Dog Lake watershed between Dog Lake and Garden Lake. (For additional details, see the Walleye Management section, page 31.)

Some river systems in the District, not presently supporting a major game fish species, may have the potential to support a brook trout population.

Other lakes and streams have been identified as underproducing waters due to the lack of desirable fish populations. In many cases, it may be beneficial to introduce certain fish species with habitat requirements which best match with the waterbody characteristics. Other fish species which will be considered for introductions into underproducing waters include splake, rainbow trout, brown trout, aurora trout and smallmouth bass. Ultimately, decisions concerning the suitability of waterbodies to support an introduced species and the choice of species best suited to an individual waterbody will be based on the intention of establishing self-sustaining populations whenever possible.

Strategy

Undertake fish community changes in underproducing waters through introductions of desirable species, primarily walleye, with the intention of establishing self-sustaining populations. Other fish species may be considered more appropriate for introduction in certain situations.

Tactics

- introduce walleye, as adults, into recipient waters which have been assessed through standard lake surveys and identification of potential spawning sites and judged to contain suitable habitat for supporting a reproducing population of walleye
- introduce brook trout, as fry, into headwater regions of river systems considered to possess suitable habitat requirements of this species. Introductions may be repeated for a couple of years in order to increase the chances of the species establishing reproducing populations

- introduce species such as splake, rainbow trout, brown trout, aurora trout, and smallmouth bass into suitable waters as is warranted by availability of stock, management priorities and angler demand

XI UNDERUTILIZED SPECIES

Discussion

Species such as smallmouth bass, northern pike, lake whitefish and yellow perch are generally underutilized by resident anglers wherever they exist in the District. They currently comprise about 30% of the catch but represent nearly 60% of the allowable harvest. The reasons that anglers do not pursue these species include insufficient information about the best fishing locations for some species (eg. smallmouth bass and trophy northern pike), lack of knowledge concerning fishing techniques (eg. lake whitefish), and special methods required to clean, fillet and prepare these species for the table.

In order to achieve the target for angling opportunities, it is vital that underutilized species contribute more.

Strategy

Encourage increased utilization of smallmouth bass, northern pike, lake whitefish and yellow perch by local residents through provision of information to address knowledge deficiencies and increased awareness of the sport fish value of these species.

Tactics

- conduct workshops and seminars on catching and handling underutilized species
- encourage the local media to cover aspects of catching and handling underutilized species
- produce information pamphlets on fishing techniques for smallmouth bass, yellow perch and lake whitefish including information on the best locations in the District to catch these species

- establish special trophy fishing regulations on selected northern pike lakes to attract attention to this species and promotequality fishing experiences while protecting important brood stock (candidate lakes include Whitefin, Legris, Vandenbrook, Poshkokagan and Dog Lakes)

XII LAKE SPECIFIC MANAGEMENT PLANS

Discussion

Throughout the District, there are a number of large waterbodies where the perceived fisheries management problems are so complex that they cannot be adequately addressed within the context of a District-wide plan. Most of these large lakes or groups of lakes have very substantial fish communities, dominated by walleye or lake trout. They receive high levels of exploitation and generally involve some degree of user group competition. In some cases, there has been shoreline modification for cottaging and resort development and additional cottaging may be an issue.

In one case (Dog Lake), the fisheries production potential is not being realized for reasons which remain unclear.

Strategy

The strategy will be to prepare detailed resource management plans for the identified lakes and their adjacent shorelands. Most will require co-operation with other branches of the Ministry and all will entail involvement with identified user groups.

Tactics

- implement any inventory and assessment required to update the information base about the fisheries resource
- implement the planning process in accordance with established Ministry policy and procedure
- integrate the implementation of these lake specific plans with the activities undertaken to implement the overall District plan
- prepare these plans in the following order of priority

Waterbody	Priority
Lac des Mille Lac	1
Dog Lake	2
Whitefish Lake	3
Arrow Lake	4
Northern Light Lake	5
Fisheries Management Plans in Waterway Parks	
- LaVerendrye	6 (in co-operation with Minnesota)
- Brightsand River	7 (in co-operation with Ignace District)
- Kopka River	8 (in co-operation with Nipigon District)

XIII COMPETITION BETWEEN USER GROUPS

Discussion

The primary fishery user group in the District is local anglers who travel throughout the District in pursuit of angling opportunities. Because of the predominance of this group, there are areas of the District where they experience competition from other groups, particularly commercial fishermen, non-resident anglers and anglers who use remote tourist facilities. Although some of this competition is real, upon closer examination much of it must be considered only perceived.

In the case of the resident angler/commercial fisherman situation, although there is some overlap in species caught (walleye in Lac des Milles Lac, lake trout in Lake Superior), most of the harvest by commercial fishermen is governed by rigorously enforced quotas which are set only after consideration of the status of the resource. Adjustments are made to these quotas to ensure the maintenance of healthy fish communities.

Non-resident anglers constitute a much smaller proportion of the angling community in the Thunder Bay area than in any other part of northwestern Ontario. Consequently, there are relatively few areas where their use of the fishery resource is considered detrimental to the interests of local anglers. With minor exception, the popular areas with non-residents (Whitefish Lake, Lac des Milles Lac, lakes in the Graham area) remain popular with and heavily used by resident anglers. Only along the border waters, where the majority of the access is from the U.S. and large groups venture into Ontario, does the extent of use by non-residents have the potential to affect resident anglers. It is not a pervasive problem now, but could grow as access in Ontario is improved.

The needs of tourist operators who manage outpost camps to retain the remoteness of their facilities brings them into conflict with some resident anglers. These anglers insist it is their right to use every road built on Crown land as a means of access to any waterbodies they can possibly get to. Throughout much of the District, these demands have been met with the result that, only in a small portion, are there opportunities to continue to supply remote tourism.

In D.L.U.G., the benefits of retaining these tourism opportunities were acknowledged. For the identified remote tourism lakes (Appendix 5) a commitment was made to manage the land surrounding them and roads in their vicinity to ensure that changes in accessibility do not occur.

Strategies

Different strategies must apply to these differing situations.

The strategy regarding the angler/commercial fisherman conflict will be to continue to establish and enforce quotas and other restrictions to ensure commercial harvests do not jeopardize angling fisheries.

For the few sites where resident anglers may encounter excessive competition from non-residents, we will continue to monitor the situation and, should it become necessary, impose restrictions limiting non-resident use of the resource.

The problem of the desires of resident anglers negatively impacting outpost camp operators will be resolved by undertaking whatever steps are possible to ensure that changes in the accessibility of the lakes do not occur.

Tactics

Anglers/Commercial Fishermen

- monitor the fisheries, both sport and commercial, to maintain good information regarding the status of fish stocks
- adjust quotas and sport fish regulations as needed to conserve healthy populations
- undertake patrols and investigations to ensure that applicable regulations and quotas are adhered to
- improve public awareness of the role commercial fishermen play in maintaining balanced fish communities and supplying fish to non-anglers

Resident/Non-Resident Anglers

- monitor non-resident use of fisheries in potential problem areas
- consider implementation of special restrictions on non-residents such as those developed in the Northwestern Region
- implement changes to management regulations to ensure that the total harvest remains within sustainable levels in affected lakes

Resident Anglers/Remote Tourism

- wherever possible, locate roads so the accessibility of remote tourism lakes does not change
- where roads must be located so that access changes could occur, identify sites where the roads can be blocked through gating, or bridge, or culvert removal
- enact special regulations which will ensure that commitments to provide remote tourism opportunities are fulfilled

XIV OVERHARVEST OF FISH STOCKS

Discussion

The overharvest of a particular fish species in a waterbody involves the removal of quantities of fish in excess of that which the waterbody has the ability to produce over a period of time. Overharvesting can occur with any fish species, on any size waterbody, over any period of time; heavy fishing pressure is the only constant.

Newly accessed waterbodies supporting popular sportfish have traditionally received heavy fishing pressure for a short period of time. Generally this does not lead to a chronic overharvesting situation unless the waterbody is relatively small and/or the fish species relatively unproductive (eg. lake trout). It can also occur if the waterbody is readily accessible to a large angling population such as that which exists in Thunder Bay.

Lake trout in relatively small inland lakes are most vulnerable to overharvest. Since this species is the least productive of the popular sportfish, limited in distribution, and vulnerable to angling during certain periods of the year, overharvesting occurs frequently. Many lake trout lakes within Thunder Bay District have been producing fewer, smaller and younger catches than similar lakes in surrounding Districts; all signs of an overharvest situation.

Many walleye populations located within a few hours drive of Thunder Bay also sustain heavy fishing pressure when access to the lakes is easy and unrestricted. Although this species is far more productive and more widely distributed than lake trout, even in some large lakes supporting walleye we have experienced substantial reductions in harvest and associated reductions in recreational opportunities. Access restrictions continue to inhibit overfishing on a few large lakes but as new roads are built to extract timber, these

restrictions are reduced and the chance of these lakes becoming overharvested is increased.

Strategy

The strategy to solve overharvest problems that have developed on some lakes and inhibit the emergence of this problem on additional lakes will be to employ specific season and catch restrictions, special closures to protect populations when they are most vulnerable and new approaches to managing the access to certain lakes to encourage the distribution of anglers.

Tactics

- continuation of the shortened lake trout season in angling Division 21 to reduce the total angling harvest and enable the restoration of depleted populations
- prohibition of angling in important walleye spawning areas on heavily fished lakes (eg. Shebandowan Lake)
- institute special fishing regulations (eg. "slot size" restrictions) experimentally on a few heavily fished walleye lakes to assess the effects on the fishery
- continue walleye introductions into suitable waterbodies in close proximity to Thunder Bay to distribute fishing pressure
- review access plans from other branches and the forest industry to ensure planned access does not have the potential to create overharvesting problems in un-accessed waterbodies
- unauthorized roads and access points creating the potential for overharvesting of fish stocks in waterbodies must be dealt with quickly and effectively before a problem develops

- allow the development of commercial facilities that will provide controlled access and aid in fisheries management on selected large lakes such as Garden, Holinshead, Kashishibog, Lac des Iles and Harmon Lakes.

XV INADEQUATE INFORMATION

Discussion

As a prerequisite to effective fisheries management, accurate and up-to-date information concerning the resource and its users is vital. Inadequate information is apparent in 3 predominant areas:

1) Lack of Complete Inventory

A total of 310 District lakes have been surveyed as part of the provincial aquatic habitat inventory programme. This represents 62% of the inland water surface area but only 3.3% of the lakes by number. Many lakes remain unsurveyed with little inventory information. In addition, 15 coldwater streams, representing 20% of the total, have been surveyed but to date no warmwater rivers have been inventoried. With only a couple of exceptions, most lake trout lakes have been surveyed.

2) Detailed Assessment of Fish Populations

Detailed information concerning fish community structure is lacking for most lakes. Gross District-wide estimates are inadequate for specific lake management decisions, pointing to the need for more in-depth studies to examine parameters such as length and age classes, growth rates, age of maturity, feeding and recruitment of young.

In addition, the results of stocking species such as brook trout and walleye introductions should be assessed in order to increase the effectiveness of these management techniques.

3) Insufficient User Information

The varied users and the utilization they make of the fisheries resources need to be better quantified. In the

absence of a resident angling licence, large segments of the population are surveyed periodically but the results of these angler surveys are subject to significant levels of error. A resident angling licence would better quantify the number of anglers and allow for a more efficient means of surveying them for information regarding species preferences, amount of time spent angling and numbers of fish caught.

Creel surveys have been conducted on selected lakes as a means of determining reliable estimates of actual harvest. However, this type of work tends to be labour-intensive and therefore costly. Recent creel surveys in the District have been conducted on selected lake trout lakes; Whitefish Lake, Lac des Mille Lacs and Lake Superior. There is a definite need to continue to conduct creel surveys to better quantify the users and the harvest.

Strategy

The strategy will be to increase efforts aimed at gaining accurate and up-to-date information concerning the fisheries resource and its users. Steps will be taken to resolve the problems of inadequate information regarding the lack of complete inventory, the need for detailed assessment of fish populations, and insufficient user information.

Tactics

- continue to conduct lake and stream surveys on priority waters - priority will be given to walleye lakes, potential walleye introduction lakes, brook trout waters and lakes which are about to be accessed by roads - some important lakes scheduled for surveys are Crayfish, Bishop, Bilkey, Unknown and Mountain - (at least one lake should be surveyed

on every quaternary watershed across the District)

- conduct detailed assessments of fish populations in prominent lakes by means of index netting projects and other monitoring projects as warranted
- support and stimulate fisheries research and assessment by the provincial Fisheries Research Units (Walleye, Productivity) and local Fisheries Assessment Units (Quetico-Mille Lacs and Lake Superior) and apply new knowledge gained to equivalent fish communities in the District
- pending implementation of a resident angling licence, conduct angler surveys by means of questionnaires in order to gain more reliable information concerning utilization and harvest
- utilize volunteers/co-operators to supply harvest information
- instigate and undertake experimental management projects for controlling the level of harvest from selected lakes and assess their value for more broad application
- apply new technology (computers) to aid and expedite data management and reporting
- improve fisheries management skills of Ministry fisheries staff through training courses and in-house workshops and seminars

XVI DETERIORATION OF FISH HABITAT

Discussion

The deterioration of fish habitat refers to a decrease in a waterbody's ability to support fish caused by the influence of human activity. Fish habitat can become deteriorated either directly through physical alterations or indirectly through water quality impairment.

Likely the most obvious example of habitat deterioration is the accumulation of refuse in a waterbody. Many of our streams have such a problem preventing upstream migration of rainbow trout. Streamside and shoreline modifications caused by the removal of trees and vegetation by timber harvesting companies and landowners can have very detrimental effects on fish habitat. The removal of vegetation causes a loss of cover and shade as well as increased susceptibility to erosion of shoreline soil. Eroded soil, as well as shoreline disturbances, contribute towards siltation of spawning and nursery habitat in some areas.

Residential and cottage development on shorelines can have profound effects on fish habitat. Leakage of septic systems causes nutrient enrichment of the water, thereby upsetting the balance of nutrient cycling. Aquatic vegetation growth is stimulated and results in oxygen depletion as the vegetation dies and decays on a yearly basis.

Water quality impairments also results from industrial discharges entering aquatic systems and run-off from agricultural land where fertilizers and pesticides have been applied.

Deterioration of fish habitat has occurred at some locations in the District, mostly at minor levels. In most cases, any potential problems are minimized or avoided through the plan input and review

process. However, at sites where deteriorated conditions exist, steps must be taken to rehabilitate lost habitat back into a productive state.

Strategy

Utilize provisions of various laws (Fisheries Act, Lakes and Rivers Improvement Act, Beach Protection Act, Public Lands Act) to prevent further deterioration of fish habitat and encourage remedial action to rehabilitate lost habitat where deteriorated conditions exist.

Tactics

- use habitat protection provisions of current legislation to prevent undesirable habitat changes
- support Ministry of the Environment in applying water quality guidelines
- identify and assess existing cases of habitat deterioration
- negotiate habitat improvement arrangements with landowners
- encourage involvement of local fish and game clubs and other concerned groups in taking on projects to rehabilitate deteriorated habitat with financial support from the Community Fisheries Involvement Programme (CFIP). Sites presently being considered for rehabilitation work include Corbett Creek, Neebing River and McVicar Creek.

XVII INTRODUCTION OF UNDESIRABLE SPECIES

Discussion

Unplanned introductions of fish species into waters in which they do not naturally occur often have long term negative effects. Newly established species usually undergo a tremendous population surge and compete with species which were already present in the lake. When the indigenous species support established fisheries, the usual result is a reduction of fishing opportunities which are not compensated for by the presence of the additional species.

Perch and smelt are the species which most often are cited when discussions of undesirable species occur. Perch are known to become dominant in brook trout lakes and render stocking unsuccessful. The effects of smelt, which have become established in 13 District lakes, are as yet unclear but are generally considered detrimental.

In fact, most species of fish can be considered undesirable in some circumstances. While smallmouth bass have produced populations which can sustain good fisheries in many situations; in other cases their establishment has negatively affected other top predators or densities have become so great that stunting occurs. In the case of stocked brook trout lakes, results in terms of growth and harvest are best when no other fish species are present. As other species are introduced, usually by anglers discarding live minnows from their bait buckets, the return to anglers from stocking declines and if perch become established, the stocking is terminated.

Strategy

The general strategy will be to take measures to reduce the probability of unplanned introductions through public education and increased enforcement.

Tactics

- produce an information pamphlet explaining the problem of introduced undesirable fish species and how it happens
- inform the public that it is illegal to use live smelt or yellow perch as bait or intentionally introduce any species into a waterbody where that species does not currently exist
- increase enforcement efforts to ensure compliance with regulations designed to prevent the introduction of undesirable fish species

FISHERIES MANAGEMENT ZONING

Fisheries management concerns are unequally distributed across the District. To more clearly focus the application of tactics to the area where the concern exists, the District has been divided into nine zones (Figure 5). They represent areas with a blend of common characteristics including fish species distribution, fish community structure, degree of human development and road access.

The zone descriptions include brief statements of its location; the means of access, the fish species distribution, the uses made of those fish and what the land use intent of the zone is based on the District Land Use Guidelines. The applicable fisheries management strategies and tactics which will be applied to the specific concerns in each zone are listed in tabular form for each zone.

Fig. 5: FISHERIES MANAGEMENT ZONES

ZONE 1 - THUNDER BAY SOUTH

A. AREA DESCRIPTION

i) Location

- relatively small zone taking in the rural areas west and south of the City of Thunder Bay

ii) Access

- the zone is accessed by one major highway; Highway 61 extending from Thunder Bay to the International Border
- several secondary highways provide additional access; Devon Road (Highway 593), and Highways 590, 595, 588 and 608

iii) Species Distribution

- introduced populations of walleye are present in only two lakes; Oliver and Cloud
- smallmouth bass have also been successfully introduced into Oliver and Cloud Lakes, as well as Lenore and Crystal
- lake trout distribution is limited to only a few lakes; Loch Lomond, Fallingsnow, Oliver, Sunset, Pete and West Pennock
- several small lakes are stocked with brook trout on a routine basis
- stream populations of brook trout are well established in the numerous rivers and creek in the zone
- spring and fall runs of rainbow trout and Pacific salmon are present in some of the rivers flowing into Lake Superior (ie. Cloud River, Pigeon River)

iv) Principle Uses

- limited sportfishing effort exerted on brook trout waters including stocked lakes and natural stream populations

- lake trout angling on Oliver, Fallingsnow and Pete Lakes
- cottage development is present on several lakes (Oliver, Cloud, Pete, Lenore, Sunset)

B. LAND USE INTENT

- principle land use is rural residential and farming
- timber harvesting is also on-going, particularly on Crown land in the north and south-west portions of the zone - much of the timber harvesting is done by smaller local companies under authority of District Cutting Licences (DCL's)
- fisheries related uses include sportfishing, cottaging, and baitfish harvesting

C. ZONE APPLICATION OF DISTRICT STRATEGIES - Zone 1

SPECIFIC CONCERNS	APPLICABLE DISTRICT STRATEGY	SPECIFIC TACTICS	DISTRICT PRIORITY
Lake Trout Lakes - heavy angling pressure and possible overharvest	Lake trout management	- reduction in open season during vulnerable periods initiated in 1984	Implemented
A) Fallingsnow Lake	Lake trout management	- indicator lake to monitor effects of season reduction	High
B) Pete Lake	Lake trout management	- discourage further cottage development, etc	Medium
C) Oliver Lake	Lake trout management	- indicator lake to monitor effects of season reduction	High
Smallmouth bass in 4 lakes and stream populations of brook trout are presently underutilized	Underutilized species	- information pamphlets on fishing techniques and suitable locations for angling within short distance of Thunder Bay	High
Loch Lomond - restricted access for lake trout angling	Underutilized species	- negotiate access agreements with landowners	Medium
Arrow River - lack of information concerning habitat types and species present	Inadequate information	- conduct standard preliminary investigations	Low
Numerous unsurveyed streams and brook trout lakes	Inadequate information	- conduct standard lake and stream surveys	Medium
Deteriorated water quality due to cottage development and shoreline modifications	Deterioration of fish habitat	- continued monitoring by MOE	High
Some deterioration of streams in rural areas causing loss of habitat for brook trout and creating barriers for migrating rainbow trout and Pacific salmon	Deterioration of fish habitat	- habitat improvement agreements with landowners - involve concerned groups in streams rehabilitation projects supported by CFIP	Medium

ZONE 2 - THUNDER BAY

A. AREA DESCRIPTION

i) Location

- small zone immediately surrounding and including the City of Thunder Bay and extending north to Dog Lake, taking in the highly developed cottage lakes north of the City

ii) Access

- the zone is transversed by two major highways, Highway 11-17 West and East, as well as Highway 61 to the south
- secondary highways providing access are Highway 130 to the south, Highway 102 (Dawson Road) which bisects the zone in half - north and south, and Highways 589 and 591 providing access to cottage lakes north of the City

iii) Species Distribution

- only one lake trout lake, Hawkeye Lake, is present in the zone
- walleye have been introduced successfully into a few lakes (ie. Little Dog, Hazelwood, Surprise Lake)
- walleye are also present in the Kaministiquia River, originally only downstream from Kakabeka Falls, but are found in the upper reaches as a result of introductions within the watershed
- brook trout are regularly stocked in a couple of small lakes but natural populations are present in many of the streams and creeks such as the Neebing River, McIntyre River, McVicar Creek and Corbett Creek
- spring and fall runs of rainbow trout and Pacific salmon are present in all the major streams flowing into Lake Superior

- as well, some of the headwater feeder creeks also receive runs of rainbow trout

- smallmouth bass populations have been established following introductions into several of the cottage lakes (ie. Hawkeye, One Island Lake)

iv) Principle Uses

- limited sportfishing opportunities exist due to the lack of lakes in this zone, however, the streams and rivers provide many opportunities for trout fishing particularly spring rainbow trout fishing in the rivers within the City limits

- cottage development is extensive on most of the lakes in the northeast portion of the zone

- the cottage lakes receive most fishing pressure from the cottagers

- Hazelwood Lake, partially under the jurisdiction of the Lakehead Region Conservation Authority, receives pressure from local residents

B. LAND USE INTENT

- principle land uses are residential, rural residential and agricultural

- fisheries related uses include sportfishing, cottaging and baitfish harvesting

C. ZONE APPLICATION OF DISTRICT STRATEGIES - Zone 2

SPECIFIC CONCERNS	APPLICABLE DISTRICT STRATEGY	SPECIFIC TACTICS	DISTRICT PRIORITY
Some trout stream sections lack public access due to private land holdings (ie Neebing River, Brule Creek, Corbett Creek)	Underutilized species	- encourage access permission from landowners and promote co-operation for possible stream management work	Low
Kaministiquia River - water quality impairment east of Highway 61 - lack of knowledge concerning fish community and habitat	Deterioriation of fish habitat Inadequate information	- encourage continued monitoring by MOE and increased efficiency of abatement programmes - investigate extent of habitat and status of fish community	High Medium
Intensively developed cottage lakes have eutrophication problems due to nutrient loading and deteriorated habitat due to shoreline modifications	Deterioration of fish habitat	- support MOE on enhancement efforts - prevent recurrence of problems on other lakes with planned cottage development	Medium
McVicar Creek - potential pollution problems - some habitat deterioration and stream bank erosion	Deterioration of fish habitat	- monitor habitat on a rotational basis (every 2 years) - encourage habitat rehabilitation work and tree planting for bank stabilization	High High
McIntyre River - dam at Lakehead University obstructs upstream migration of rainbow trout	Deterioration of fish habitat	- encourage the redesign and construction of a new fish ladder with co-operation of LU and LCRA	High
Corbett Creek - natural barriers, and habitat deterioration (degradation of stream banks by cattle)	Deterioration of fish habitat	- encourage stream rehabilitation work in co-operation with landowners and organized sportsmen	Medium-High

C. ZONE APPLICATION OF DISTRICT STRATEGIES - Zone 2

SPECIFIC CONCERNS	APPLICABLE DISTRICT STRATEGY	SPECIFIC TACTICS	DISTRICT PRIORITY
Neebing River - some natural barriers that restrict rainbow trout movement	Deterioration of fish habitat	- stream rehabilitation work to remove barriers	Medium
- adjacent agricultural activities leading to habitat deteritoration		- promote public awareness and approach to prevent further degradation by cattle and runoff	Medium

ZONE 3 - THUNDER BAY EAST - DORION

A. AREA DESCRIPTION

i) Location

- relatively small zone in southeast portion of the District, including Sibley Provincial Park (DLUG Area 3.0) bordering on Thunder Bay and Black Bay of Lake Superior

ii) Access

- the zone is accessed by one major highway, Highway 11-17 East, and 2 secondary highways, Spruce River Road (Highway 527) and Pass Lake Road (Highway 587)
- other access roads include agricultural roads (Pearl Road, Wolf River Road, Ouimet Canyon Road) and forest access roads (ie. Dorion Cut-off Road)

iii) Species Distribution

- at least a dozen lake trout lakes are present, but some populations are marginal
- presently includes 37 brook trout lakes, 33 of which are stocked on a regular basis
- an additional 8 lakes have combined lake trout-brook trout communities with the brook trout populations supplemented by stocking
- majority of rivers and creeks have natural populations of brook trout
- lower stretches of rivers draining into Lake Superior support runs of rainbow trout; Pacific salmon have been observed in a few streams
- marginal populations of walleye exist in only a handful of lakes (ie. Marie Louise, Wolf, Venice)

- smallmouth bass populations are present in a few lakes around Pearl (ie. Loon Lake) and in Marie Louise Lake
- an introduced population of largemouth bass is present in Pounsford Lake in Sibley Park

iv) Principle Uses

- primary sportfishing effort exerted on brook trout waters; stocked lakes, natural lakes and streams
- most lake trout lakes have planktivorous populations producing small, lean fish but support considerable sportfishing pressure
- limited pressure is exerted on bass and walleye populations

B. LAND USE INTENT

- principle land use is timber harvesting concentrated mainly in the northern portion of the zone accessed by the Dorion Cut-off Road
- agricultural land is located primarily in the eastern portion of the zone adjacent to the shore of Black Bay
- cottaging is limited to Loon, Bass, and Walkinshaw Lakes
- tourism opportunities are supplied by Sibley Provincial Park and several small private campgrounds
- fisheries related uses include sportfishing primarily for trout species, limited cottaging and baitfish harvesting

C. ZONE APPLICATION OF DISTRICT STRATEGIES - Zone 3

SPECIFIC CONCERNS	APPLICABLE DISTRICT STRATEGY	SPECIFIC TACTICS	DISTRICT PRIORITY
Abigogami Lake, Innes Lake - prime lake trout lakes	Lake trout management	- indicator lakes to monitor effects of season reduction	High
- some lakes have the potential to produce large trophy fish	Brook trout management	- implement trophy fishery regulations following assessment of brook trout population in selected lakes (Unknown, Penassen Lakes)	High
- lake populations of stock brook trout may be overharvested	Brook trout management	- provide improved spring and summer angling quality in selected lakes through winter season closures (ie Cavern, Falls)	Medium
- access restrictions imposed by private landowners (Hunter Lakes, McKenzie River, Blind Creek, Wild-goose Creek)	Underutilized species	- encourage access permission from landowners	Low
- stream populations of brook trout may be underharvested	Underutilized species	- encourage increased used by resident anglers	Medium
- numerous unsurveyed streams and brook trout lakes	Inadequate information	- conduct standard lake and stream surveys	Medium
- deterioration of trout streams adjacent to farm land, loss of habitat for brook trout and creating barriers for migrating rainbow trout and salmon (ie Portage Creek)	Deterioration of fish habitat	- encourage stream rehabiltation projects with public involvement and funding through C.F.I.P.	Medium
Loon Lake - suspected nutrient loading and shoreline modifications due to extensive cottaging	Deterioration of fish habitat	- continued monitoring by MOE - assess existing cases of habitat deterioration	Medium

ZONE 4 - DOG LAKE (Spruce River Road - Dog River Road)

A. AREA DESCRIPTION

i) Location

- largest single zone located in the northeast quadrant of the District

ii) Access

- the zone is primarily accessed by two major forest access roads, the Spruce River Road (Highway 527) and the Great Lakes Forest Products Dog River Road
- the Garden Lake Road (Highway 811) branches off the Spruce River Road at Mileage 70 and connects with the Dog River Road system

iii) Species Distribution

- zone characterized by large watersheds with predominately northern pike-yellow perch lakes
- native distribution of walleye is limited to a couple of small quaternary watersheds, however; the range of walleye has been extended as a result of adult walleye introductions undertaken in recent years (early 1970's to present)
- adult walleye introduction efforts have been recently concentrated in this zone, particularly in the Dog River watershed which historically contains no natural populations of walleye
- only four lake trout lakes are in the zone (Lac des Iles, Mooseland, Walotka, Voltaire)
- scattered populations of brook trout exist in creeks and rivers in northeast corner of zone (ie. Heaven Creek)

- brook trout have recently been introduced as fry into the Oskondaga River and Sunshine Creek

- smallmouth bass have only been reported from Dog Lake but the status of that population is unknown

iv) Principle Uses

- sportfishing activity is relatively low due to the lack of preferred species, walleye and trout

- some northern pike lakes are recognized as having the potential to produce trophy-sized fish (ie. Whitefin, Legris, Vandenbrooks, Poshkokagan, Dog)

- a tourist lodge operation with road access is situated on East Bay of Dog Lake and caters primarily to American anglers after "the big northern"

- cottage development has been allowed on several designated lakes within close proximity to the City of Thunder Bay and accessed by the Spruce River Road

- Muskeg Lake, presently supporting a northern pike-lake whitefish community, is monitored by the OMLFAU and is one of numerous candidates for a walleye introduction

B. LAND USE INTENT

- principle land use is timber harvesting

- an open-pit platinum and palladium mine is planned to go into operation in the Lac des Iles area

- fisheries related uses include baitfish harvesting, cottage development and limited sportfishing

C. ZONE APPLICATION OF DISTRICT STRATEGIES - Zone 4

SPECIFIC CONCERNS	APPLICABLE DISTRICT STRATEGY	SPECIFIC TACTICS	DISTRICT PRIORITY
Numerous lakes and rivers, not presently supporting walleye populations, have the potential to support walleye	Walleye management/ underproducing waters	- introduce adult walleye in order to establish self-sustaining populations in relatively close proximity to Thunder Bay at a rate of 1-2 lakes per year	High
Lakes having received recent introductions of walleye remain unconfirmed regarding successful reproduction	Walleye management/ inadequate information	- assessment netting to confirm successful reproduction	High
Many lakes with pike populations greatly underharvested (some lakes have capability to produce very large "trophy" pike)	Underutilized species	- promote increased used of pike by anglers - implement trophy fishery regulations following assessment of pike populations in selected lakes - improve road access to lakes with underutilized species	High Medium Medium
Dog Lake - lack of a viable fish community - water level drawdowns by Ontario Hydro causes problems with fish recruitment and conflicts with cottagers	Need for specific fisheries management/ deterioration of habitat/competition between user groups	- encourage development of a lake management plan with fisheries input - work with Ontario Hydro to maintain water levels during critical periods	High
Some potential lakes for walleye introductions remain unsurveyed	Inadequate information	- conduct lake surveys on identified lakes to select candidates for walleye introductions (Appendix II)	Medium
Garden Lake - developing walleye population following introduction in 1977 and 1979 - uncontrolled access could compromise the quality of the developing walleye population	Inadequate information/ competition between user groups Overharvest of fish stocks	- assessment netting to assess developing walleye fishery - feasibility study for tourist facility development	Medium Medium

ZONE 5 - LAVERENDRYE BORDER WATERS

A. AREA DESCRIPTION

i) Location

- small zone including all lakes and rivers along the U.S.-Canadian border extending from the western edge of the District (adjoining with Quetico Provincial Park) to Pigeon Bay on Lake Superior
- corresponds with DLUG Area No. 5.0 - Boundary Waters

ii) Access

- the zone is directly accessed by road at a limited number of sites (Mountain and North Fowl) (a deteriorated road suitable for 4-wheel drive vehicles provides access to North Lake as well)
- Highway 61 and 593 (Devon Road) provide access to Middle Falls Provincial Park as well as several sites on the Pigeon River at the eastern end of the zone
- road access is provided on the Minnesota (U.S.A.) side to various lakes (Saganaga, Gunflint and North Fowl)

iii) Species Distribution

- lake trout are well distributed through most of the lakes from Moose Lake to Saganaga Lake
- the presence of walleye populations in Saganaga, Granite, Gunflint, North, North Fowl and South Fowl are the result of introductions made on the American side of the lakes in the 1940's
- smallmouth bass are present in all the walleye lakes as well as South and Rose Lakes

- no brook trout waters exist except perhaps to a limited degree in the lower stretches of Pigeon River
- there are also runs of rainbow trout and Pacific salmon in the Pigeon River as far as High Falls

iv) Principle Uses

- extensive recreational use is made of the border waters system primarily by non-resident canoeists - canoe routes are well-established through the border waters connecting with routes leading further into the District and with Boundary Waters Canoe Area routes on the American side - the entire zone, west of Middle Falls Provincial Park, has been recommended for park status; LaVerendrye Provincial Park, which is now in the planning stage
- several tourist lodges are established on Gunflint and Saganaga Lakes and provide large-scale canoe outfitting services on the American side - an additional American tourist lodge is situated on North Fowl Lake
- no tourist lodges exist on the Canadian side of the border waters with the exception of Saganaga Lake where three Canadian lodges are located
- some sportfishing pressure is exerted by residents on road-accessible lakes - Mountain, North Fowl, South Fowl, and on Rose Lake which is accessible from Arrow Lake
- other lake trout lakes are accessed by snowmachine during the winter season
- moderate cottage development has taken place on Saganaga, Gunflint and North Lakes most of which belong to non-resident Americans

- the Canadian portions of the border lake trout lakes have the District-wide shortened open season which is inconsistent with regulations on the American waters
- an index netting project on Saganaga Lake was undertaken in 1985 as part of a joint Ontario-Minnesota investigation assessing the current status of the fish community - special emphasis was placed on a detailed look at the walleye population to establish the basis for considering the implementation of special trophy fishery regulations similar to those already in effect on the American waters of the lake

B. LAND USE INTENT

- principle land use intent for the zone is the establishment of the LaVerendrye Provincial Park in addition to the existing Middle Falls Provincial Park
- according to DLUG the primary purpose of this area (No. 5.0) is to contribute to provincial park recreation and protection objectives - canoeing, primarily by non-resident Americans, is expected to continue at a significant level
- fisheries related uses include sportfishing, particularly directed at lake trout and walleye populations, existing cottage development and limited baitfish harvesting (ie. Mountain Lake)

C. ZONE APPLICATION OF DISTRICT STRATEGIES - Zone 5

SPECIFIC CONCERNS	APPLICABLE DISTRICT STRATEGY	SPECIFIC TACTICS	DISTRICT PRIORITY
Saganaga Lake - potential overharvest of large walleye brood stock	Walleye management/ overharvest of fish stocks	- complete a detailed assessment of the walleye community with the intention of implementing trophy fishing regulations	High
Smallmouth bass are present in most border waters and are generally underutilized	Underutilized species	- promote greater utilization of smallmouth bass populations - fishing clinic and mapping of lakes	High
Border waters - need for detailed fisheries management planning with Minnesota D.N.R. involvement to address complex issues affecting fish communities (co-ordination of harvest strategies and potential overharvest of lake trout)	Need for specific fisheries management plans	- detailed fisheries management plan to be developed and intregrated into the LaVerendrye Provincial Park Management Plan	High
Border lakes - lack of basic inventory data by M.N.R. standards	Inadequate information	- conduct standard lake surveys, primarily on lake trout lakes - need for partial surveys to complement those performed by Minnesota D.N.R.	Medium

ZONE 6 - LAKE TROUT AND TROPHY WALLEYE

A. AREA DESCRIPTION

i) Location

- relatively small zone in the southwest corner of the District extending from the border lakes (Zone 5), taking in most of the Northern Light corridor, the G.L.F.P. Camp 517 area, northward to include Baril and Burnt Island Lakes

ii) Access

- the southern portion is accessed by a secondary Highway 588

- most of the zone is accessed by forest access roads including an extension of the GLFP Matawin Limits Road connecting with the Burchell Lake Road extending from Highway 802

- Highway 11 cuts across the northern portion of the zone with GLFP forest access road extending north (Chief Peter Lake Road) and south (Camp 515 Road)

iii) Species Distribution

- heaviest concentration of lake trout lakes in the District (38 lakes)

- seven lake trout lakes have multi-species fisheries involving walleye and smallmouth bass in addition to lake trout (Northern Light, Arrow, Sandstone, Mowe, Ross, Titmarsh and Windigoostigwan)

- a few small natural walleye lakes are situated in the central portion of the zone while Addie and Roundtable Lakes in the south end have introduced populations of walleye

- significant smallmouth bass populations are also found in Plummes, Brule and Bass Lakes
- a very limited number of small brook trout lakes are stocked regularly in the area north of Arrow Lake
- brook trout have recently been introduced into Tilly Creek

iv) Principle Uses

- significant levels of sportfishing pressure are exerted on lake trout populations, particularly during the winter season
- overharvest situation prompted a reduction in the winter season to a one-month period and delayed spring season opening
- Squeers Lake is a year-round sanctuary and an additional 6 lakes have a limited summer season only (Watershed, Grouse, Partridge, Hood, Myrt and Elevation Lakes)
- lakes accessed by Highway 588 receive significant levels of recreational use by resident locals and cottagers (Arrow, Sandstone, and Northern Light Lakes)
- tourist resort operations are also in place on Arrow and Northern Light Lakes
- remote outpost camps are established on walleye lakes, Moss and McGuinnis, and a remote tourist lodge is based on Powell Lake - all 3 lakes are identified tourism lakes in DLUG
- cottage development has been allowed on several of the larger lakes (Northern Light, Arrow, Sandstone, Huronian and Windigoostigwan)

- Greenwater and Squeers Lakes, both prime lake trout lakes, are presently monitored by the Quetico-Mille Lacs Fisheries Assessment Unit

- an experimental controlled fishery has been operated on Squeers Lake during the winter season starting in 1985

B. LAND USE INTENT

- principle land use is timber harvesting and other resource extraction activities - large-scale timber harvesting operations have been on-going in recent years and this zone continues to be an area of most-active cutting in the southern half of the District

- fisheries related uses include sportfishing, particularly directed at lake trout populations, limited tourist resorts, some cottage development and baitfish harvesting

C. ZONE APPLICATION OF DISTRICT STRATEGIES - Zone 6

SPECIFIC CONCERNS	APPLICABLE DISTRICT STRATEGY	SPECIFIC TACTICS	DISTRICT PRIORITY
Lake trout lakes - heavy angling pressure and possible overharvest	Lake trout management	- reduction in open season during vulnerable periods initiated in 1984	Implemented
Burchell, Greenwater, Huronian, and Rudge Lakes - major lake trout lakes	Lake trout management	- monitor these lakes as indicators of the effects of season reduction (monitoring of Greenwater Lake by QMLFAU)	High
Squeers Lake - heavy harvest in past years necessitated year-round closure	Lake trout management/ Inadequate information	- continue closure and monitoring by QMLFAU - controlled winter fishery involving local anglers and maintain the public education component concerning lake trout management	High High
Sandstone Lake - population of large walleye (potential overharvest)	Walleye management/ Overharvest of fish stocks	- develop potential for trophy fishing by implementing special regulations	High
Arrow Lake - intensive uses made of the complex fish community that includes lake trout, walleye, northern pike and smallmouth bass	Walleye management/ Overharvest/Need for specific fish management plans	- develop potential for trophy fishing by implementing special regulations - prepare lake management plan with involvement of all user groups	High Medium
A few lakes, not presently supporting walleye populations, have the potential to support walleye	Underproducing waters/ Inadequate information	- conduct lake surveys on identified lakes to select candidates for introductions	Medium
Smallmouth bass are generally underutilized by anglers in a few lakes where they are present	Underutilized species	- promote greater utilization through public education and awareness - fishing clinic and mapping of lakes	High
Whitefish are present in most lake trout lakes and are generally not targetted on by anglers	Underutilized species	- promote greater utilization through public education and awareness	Medium

C. ZONE APPLICATION OF DISTRICT STRATEGIES - Zone 6

SPECIFIC CONCERNS	APPLICABLE DISTRICT STRATEGY	SPECIFIC TACTICS	DISTRICT PRIORITY
Northern Light Lake - intensive uses made of the complex fish community that includes lake trout, walleye, northern pike, and smallmouth bass	Need for specific fish management plans	- prepare lake management plan with involvement of all user groups	Medium
Remote tourism lakes - conflict between operators and resident anglers over access created by timber harvesting operations (Moss, Clay, Powell Lakes)	Competition between user groups	- locate roads so the accessibility of remote tourism lakes does not change - where access problems do occur, restrict access through gating or bridge/culvert removal	High

ZONE 7 - BOREAL - Lac des Mille Lacs

A. AREA DESCRIPTION

i) Location

- large zone stretching from Whitefish Lake at the south end to Graham in the northwest corner of the District

ii) Access

- the zone is accessed by two major highways; Highway 17 to the north of Lac des Mille Lacs and Highway 11 which roughly divides the zone in half, north and south
- a secondary highway, 588, provides access to Whitefish Lake and the Boreal area is accessed by the GLFP Matawin Limits forest access road system

iii) Species Distribution

- native distribution of walleye is restricted to the watersheds bounded by Highways 11 and 17, including Lac des Mille Lacs
- the range of walleye has been extended to most of the lakes and rivers south of Highway 11 including Shebandowan Lake and the "Boreal" area (GLFP Matawin Limits) south to include Whitefish Lake
- walleye were originally introduced as eyed eggs or fertilized eggs during the 1940's into Whitefish Lake and Shebandowan Lake
- range expansion of walleye through the Boreal area took place through into the 1960's
- additional lakes in the Boreal received introductions of adult walleye in 1969 - some additional lakes that are good candidates for walleye introductions still exist in this zone

- smallmouth bass, originally introduced into American portions of border lakes (likely Saganaga Lake) have expanded their range into many lakes in the Boreal area and are generally underutilized by anglers
- following original introductions in the 1940's, smallmouth bass populations are also well established in Shebandowan, Kashabowie, Little Athelstane, Nelson, Marks, Weikwabinonaw, Jacob Lake chain, Flatrock, Sprucefir and Koss Lakes
- only a few lake trout lakes are present, the most notable being Kamikau, Athelstane, Tinto and Dakota
- very limited brook trout stocking into a few small lakes

iv) Principle Uses

- intensive sportfishing pressure is exerted mostly by residents on walleye waters; this zone supports a substantial portion of the total walleye angling done in the District
- Whitefish Lake and Lac des Mille Lacs, both with heavily exploited walleye fisheries, are two of the lakes presently being studied by the Quetico-Mille Lacs Fisheries Assessment Unit
- a commercial fishing licence exists on Lac des Mille Lacs
- extensive cottage and tourist resort development has taken place over the years on Lac des Mille Lacs, Shebandowan, Kashabowie, Whitefish and Weikwabinonaw Lakes
- several lakes have been designated for cottage development in the future as outlined in DLUG
- a group of 5 sanctuary lakes are studied by the MNR Fisheries Research - Walleye Unit (Savanne, Argon, Ice, Gessie, Henderson)

B. LAND USE INTENT

- principle land use is timber harvesting and other resource extraction activities - most of the available timber has been harvested in recent years

- fisheries related uses include extensive sportfishing, tourist resorts, cottage development, baitfish harvesting and commercial fishing

C. ZONE APPLICATION OF DISTRICT STRATEGIES - Zone 7

SPECIFIC CONCERNS	APPLICABLE DISTRICT STRATEGY	SPECIFIC TACTICS	DISTRICT PRIORITY
A few lakes, not presently supporting walleye populations, have the potential to support walleye	Underproducing waters	- introduce adult walleye in order to establish self-sustaining populations (Kekekuab, Bedivere Lake)	High
Smallmouth bass are generally underutilized by anglers in several lakes where they are present	Underutilized species	- promotor greater utilization through public education and awareness - fishing clinics and mapping of lakes	High
Lac des Mille Lacs - shoreline development and nutrient loading - high exploitation level and competition between day users, cottagers, tourist operators, commercial fishermen	Need for specific fisheries management plans/competition between user groups	- develop lake management plan - continue monitoring fish community and users by QMLFAU	High High
Whitefish Lake - heavy sportfishing pressure by varied users - potential overharvest of walleye	Need for specific fisheries management plans/Overharvest of fish stocks	- prepare lake management plan - continue monitoring by QMLFAU	Medium High
Marks Lake - potential overharvest of walleye	Overharvest of fish stocks	- special regulations in order to restrict harvest, particularly when stocks are most vulnerable around spawning	Low
Shebandowan Lake - depressed growth rates in walleye	Inadequate information	- analyze data concerning depressed growth rates	High
Some potential lakes for walleye introductions remain unsurveyed	Inadequate information	- conduct lake surveys on identified lakes to select candidates for introductions	Medium

ZONE 8 - GRAHAM

A. AREA DESCRIPTION

i) Location

- large zone encompassing the northern end of the District

ii) Access

- primary access to the zone is provided by the Graham Road, a forest access road extending north from the town of Graham
- the northern end of the road presently extends past Harmon Lake into Ignace District - an extension of the Brightsand Road, branching off the Graham Road south of Kashishibog River is planned to extend out of the District to connect with the Vanessa Lake Road in Ignace District
- the Garden Lake Road (Highway 811) accesses the southeast corner of the zone from the Spruce River Road (Highway 527)
- the Obonga Lake Road penetrates the northeast corner of the zone from Nipigon District into the Uneven Lake area

iii) Species Distribution

- walleye are distributed naturally throughout this zone and are present in many large lakes connected by large river systems (Grew River, Brightsand River, Kashishibog River, Roaring River and Kopka River)
- only 4 lake trout lakes are situated in the zone (North Mawn, Little Sparkling, Gunter and Uneven) - North Mawn Lake has only lake trout whereas the other 3 lakes have lake trout-walleye communities
- no smallmouth bass or brook trout waters are presently known
- lake whitefish are present in many of the deeper lakes and northern pike are well distributed

iv) Principle Uses

- extensive sportfishing pressure is exerted on accessible walleye waters by local residents as well as non-resident Americans
- timber harvest company employees residing in bush camps spend a great deal of time angling during off-hours
- remote outpost camps are established on several walleye lakes and one walleye-lake trout lake (Uneven Lake)
- the zone contains the highest concentration of DLUG identified tourism lakes (17 of 23 in the District) offering remote tourism opportunites
- principle land use is timber harvesting which is on-going on a large scale - the proliferation of forest access road networks allows for access to be gained to many lakes in the zone and threatens the existence of remote tourism if access is unrestricted
- a tourist lodge operation with road access is situated on Pakashkan Lake
- North Mawn Lake, a prime lake trout lake, has a limited summer season only
- two candidate waterway parks are situated within this zone; DLUG Area 14.0 Brightsand Candidate and DLUG Area 16.0 Kopka Candidate - both have been recommended for park status with the emphasis primarily oriented toward typical Crown land recreational activities including canoeing, hunting, fishing and camping
- both Pakashkan and Wawang Lakes have been identified in DLUG as having the potential for future cottage development

B. LAND USE INTENT

- principle land use is timber harvesting - large-scale cutting operations are presently on-going as this zone has the most active cutting in the District
- two candidate waterway parks have been recommended for park status which will impose restrictions on access and roadways through the areas
- tourism, particularly remote tourism provided by fly-in outpost camps, will continue as an important economic factor in this zone
- fisheries related uses include extensive sportfishing, tourist operations (primarily remote outpost camps), baitfish harvesting and limited cottage development

C. ZONE APPLICATION OF DISTRICT STRATEGIES - Zone 8

SPECIFIC CONCERNS	APPLICABLE DISTRICT STRATEGY	SPECIFIC TACTICS	DISTRICT PRIORITY
Walleye waters - heavy fishing pressure on recently accessed waters	Walleye management	- careful location of forest access roads to inhibit vehicular access and reduce harvest stress on previously unexploited populations	High
Candidate waterway parks - Brightsand and Kopka Rivers	Need for specific lake management plans	- ensure that waters continue to contribute towards the District potential sportfish harvest	Low
Remote tourism lakes - conflict between remote tourist operators and resident anglers over access created by timber harvesting operations (Appendix V)	Competition between user groups	- locate roads so the accessibility of remote tourism lakes does not change - where access problems do occur, restrict access through gating or bridge/culvert removal	High
Pakashkan Lake - large, accessible lake with significant local use and tourist lodge use (potential overharvest of walleye)	Overharvest of fish stocks	- monitor use and effects on fish community to determine need for special regulations to control harvest	Low
Unsurveyed remote walleye lakes in areas slated for timber harvesting	Inadequate information	- conduct standard lake surveys on selected lakes to identify fish community structure and areas of concern	Medium

ZONE 9 - LAKE SUPERIOR

This zone is unique in the District since the strategies and tactics that will be employed specifically in it are based on the content of the Lake Superior Strategic Fisheries Plan. That Plan has been prepared concurrent with this one and serves to provide a comprehensive and co-ordinated umbrella plan to guide the development of District Fisheries Management Plans in the 5 MNR Administrative Districts which collectively manage the fisheries of the Canadian waters of Lake Superior.

The regular forum that co-ordinates the management of Lake Superior fisheries is the Lake Superior Fisheries Management Committee. On this committee are representatives from the North Central and Northeastern Regions and from each of the 5 Districts on Lake Superior.

The Lake Superior Fisheries Unit is responsible for the majority of fisheries research and assessment on the Lake. This group of biologists and technicians, based in Thunder Bay, monitors the sport and commercial fisheries, analyses the results and provides resource information to the fisheries managers to assist them in making management decisions at the District level.

A. AREA DESCRIPTION

i) Location

- all that portion of the Canadian waters of Lake Superior administered by Thunder Bay District, including Black Bay, Thunder Bay and the open lake area from the mainland offshore to the International Border and stretching from the

southern tip of Black Bay Peninsula west and south to Pigeon River

- total area: 235,400 hectares

ii) Access

- Highways 11-17, 61, 587 and Lakeshore Drive serve as the main travel corridors for those who wish to access Lake Superior

- road access to the lake is poorly developed; outside the City of Thunder Bay only a few sites are suitable for launching the size of boat required to safely fish on Lake Superior

- pedestrian and small boat access can be gained at a few more locations but only a very small portion of the fisheries potential can be realized in this way

iii) Species Distribution

- Lake Superior is a classic oligotrophic system most suited to species which depend on deep, cold, clear, well-oxygenated water for their survival

- oligotrophic systems are low in productivity; the average potential yield for Lake Superior is calculated to be 0.93 kilograms per hectare per year, a very low level

- while the lake does support many fish species, relatively few are of primary interest - lake trout, lake herring, lake whitefish, deep-water ciscoe (chub), rainbow smelt - these species are generally widespread and abundant in most areas

- of lesser but still significant interest are rainbow trout, brook trout, Pacific salmon, walleye, yellow perch and northern pike, species with lower levels of abundance and usually restricted ranges due to habitat preferences

- sea lamprey is a relatively recent member of the Lake Superior fish community and in combination with overharvest was responsible for the severe declines in lake trout abundance experienced from the late 1950's through to the present

- considerable management efforts to control sea lamprey populations, stock lake trout, and restrict lake trout harvest have resulted in the restoration of lake trout numbers to significant levels throughout much of the suitable lake trout habitat in the Thunder Bay District portion of Lake Superior

- complete rehabilitation of lake trout to an optimum level of abundance is a goal not yet attained

- lake herring, the species which makes up the greatest portion (82%) of the commercial harvest, shows great variations in local abundance through the year

- during the fall, particularly in Black Bay, very large numbers of lake herring congregate prior to spawning - it is believed these fish move into the inshore waters of Black Bay and Thunder Bay from a large part of the main body of the lake thus accounting for their abundance and ability to support very substantial harvests

- lake whitefish are distributed widely but they also vary in abundance over the year although the fluctuations are not as dramatic as for herring

- lake whitefish and herring are of interest primarily to commercial fishermen

- deep-water ciscoe (chub) are found only in the very deep (>93 metres) parts of the lake and are of interest only to the commercial fishery

- rainbow smelt, an introduced species like the sea lamprey, experienced a sharp decline in numbers in the early 1980's but appear to be gradually recovering - they serve as forage for larger predatory species like lake trout and salmon and support a short, but intense sport fishery during their spring spawning runs

- rainbow trout, brook trout, walleye, yellow perch, and northern pike are usually encountered in very near-shore locations, normally during or very shortly after spawning

- rainbow trout are most actively sought in tributary streams after these fish leave the lake.

- Pacific salmon include pink salmon, coho salmon, and chinook salmon - pinks were introduced to the Great Lakes from a hatchery in Port Arthur (now the City of Thunder Bay) in 1955, reached their peak abundance in local tributaries in 1979 and since then have declined to near absence in the fall of 1985

- coho and chinook salmon have been regularly stocked by American jurisdictions on their side of the lake since Michigan began this initiative in 1966. Both species have become established and reproduce naturally to some degree in other parts of Lake Superior but only very limited spawning by either species has been noted in rivers in Thunder Bay District

iv) Principle Uses

- traditionally Lake Superior has been noted for its commercial fishery, a use of the fish resource which is still a viable and appropriate activity on this large body of water

- in Thunder Bay District 33 commercial fishermen hold licences
- all commercial fishing is done under quota, the licences set out how many kilograms of each species that may be harvested under authority of the licence.
- while the total annual quota for all species amounts to approximately 1.54 million kilograms, market conditions and weather have normally influenced the harvest such that it is much below the quota (.96 million kilograms in 1984)
- the sport fishery targetted almost exclusively on lake trout prior to their drastic decline in the late 1950's and has only very recently (since 1980) shown any indication of re-building to its previous level
- angling in the open water season for lake trout began to increase during the late 1970's as the result of good sea lamprey control and substantial stocking began to make considerable numbers of catchable lake trout available to anglers
- interest in lake trout fishing jumped drastically in 1982 when ice fishermen discovered large numbers of native (unclipped) lake trout living in deep water near Caribou Island in Thunder Bay. This fishery developed from virtually nothing prior to 1982 to a very active fishery that has harvested 14,000 to 17,000 kilograms of lake trout each winter since 1983. The total annual angler harvest (winter plus summer) is estimated to be approximately 30,000 kilograms
- the development of this fishery has coincided well with reductions in the length of the winter lake trout season in

the inland waters of the District

- the sport fisheries associated with nearly all other species are confined to very nearshore areas. While no data exists to substantiate it, it is felt that the majority of this angling occurs in or very near the City of Thunder Bay mostly at the mouths of the rivers. Elsewhere, only the mouth of McKenzie River and in Jarvis, Cloud and Pine Bays does angling for these other species occur
- one species, chinook salmon, has captured the imagination of many local anglers. In 1983, enough fish of this species appeared in this part of Lake Superior to attract the attention of fishermen who have been travelling to Lake Michigan each year to fish for them. Even though only very few have been caught each year since then, the vision of having good numbers of chinook salmon near Thunder Bay persists with enough anglers that comments in support of salmon stocking were frequently made at the first Open House

B. LAND USE INTENT

- the Thunder Bay District Land Use Guidelines establish the intent of this zone to be the provision of low intensity public recreation and tourism opportunites based on aquatic resources and on the offshore islands
- commercial uses are limited to the commercial fishery and very tightly controlled aggregate and timber extraction
- four nature reserve parks are established on islands; Porphyry Island, Edward Island, Thompson Island and Le Pate on Pie Island

C. OBJECTIVES AND TARGETS

- the Lake Superior Strategic Fisheries Plan has established four objectives and associated targets for all fisheries management activities

- the objectives for the Thunder Bay District portion remain unchanged but the targets have been modified since only a portion of the total lake is in this zone

1) Environmental Objective

- To provide an environment in Lake Superior which can support self-maintaining populations of desired and healthy fish

Environmental Target

- To achieve no net loss of the productive capacity of undegraded habitats supporting Lake Superior fisheries to the year 2000.

- To restore habitats in the vicinity of Thunder Bay that have suffered damage and to increase, if possible, the productive capacity of these habitats to achieve a net gain for selected nearshore fisheries by the year 2000.

2) Lake Trout Objective

- To provide for the maintenance, protection and enhancement of lake trout populations and to provide recreational angling opportunities and commercial harvest for this species based on an optimum sustainable yield.

Lake Trout Target

- To harvest, by the year 2000, 120,000 kilograms of lake trout annually from the portion of Lake Superior administered by Thunder Bay District.

3) Sport Fish Objective

- To meet the demand for sport fishing consistent with the limits of an optimum sustained yield.

Sport Fish Target

- To provide by the year 2000, 90,000 angler-days at a success rate of one kilogram per angler-day for an angler harvest of 90,000 kilograms of top predators.

4) Commercial Fish Objective

- To encourage the harvest of commercial fish when it is biologically and economically possible.

Commercial Fish Target

- To produce by the year 2000, 1.5 million kilograms of commercial fish annually of which 60,000 kilograms will be lake trout.

Assumptions that have been made in determining these targets are:

1. lake trout populations will be fully rehabilitated in this zone and able to sustain an average harvest of approximately 0.5 kilograms per hectare per year;
2. the harvest of lake trout will be evenly split between sport and commercial fishermen;
3. numerous other top predators including rainbow trout, brook trout, salmon, walleye and northern pike will be harvested by anglers;
4. the commercial fishery will continue to harvest large quantities of lake herring that migrate into the zone from elsewhere in Lake Superior.

D. STRATEGIES

The Lake Superior Strategic Fisheries Plan identifies a number of specific strategies, some of which are similar to District strategies and will be addressed in the normal course of implementing the rest of this Plan. Some, however, have particular applicability to this zone:

- **encourage recreational fishermen to use the fishery resource of Lake Superior;**
- **increase fish stocking for rehabilitation and to provide angling opportunities;**
- **protect and enhance brood stocks of native lean lake trout;**
- **encourage commercial fishermen to target on fish of low angler interest in inshore areas;**
- **protect the aquatic habitat of Lake Superior so there is no net loss of habitat or desirable species;**
- **share the harvest of lake trout in Lake Superior equally between anglers and commercial fishermen.**

The strategies and tactics that apply to the fisheries management concerns that are specific to this zone are outlined below. Strategies which are applicable across the District as well as strategies specific to Lake Superior have been identified. Most of the tactics are adaptations of those developed for general application throughout the District.

D. ZONE APPLICATION OF DISTRICT STRATEGIES - Zone 9

SPECIFIC CONCERNS	APPLICABLE DISTRICT STRATEGY	SPECIFIC TACTICS	DISTRICT PRIORITY
Inadequate access to allow full utilization of angling potential	Encourage recreational fishing	- ensure good boat launch facilities are included in Middle Falls Park Management Plan	Medium
		- encourage the development of improved access by entrepreneurs, municipalities, etc. on private lands	Medium
		- negotiate agreements to allow access developments on Crown Land	Low
Loss of fish habitat through shoreline modification especially in the City and areas with extensive cottage developments	Habitat protection	- require proper environmental reviews to ensure effects of any shoreline modifications are mitigated	High
		- prohibit modifications which will cause net loss of habitat	High
	Law enforcement	- initiate prosecution in cases where destruction has occurred without authorization	Medium
Water quality impairment in Thunder Bay Harbour and Kam River estuary	Habitat protection	- support efforts of MOE to increase controls on discharges of undesirable effluent from industries	High
		- assist in the monitoring of fish to detect presence of harmful contaminants by collecting and sampling fish in co-operation with other agencies	High
Demand for establishment of a harvestable population of chinook salmon in nearby waters of Lake Superior	Increase stocking	- allow for the development of CFIP projects to rear and release chinook salmon in limited quantities in selected rivers	Medium
		- monitor survival rates and effect on the forage base	High

D. ZONE APPLICATION OF DISTRICT STRATEGIES - Zone 9

SPECIFIC CONCERNS	APPLICABLE DISTRICT STRATEGY	SPECIFIC TACTICS	DISTRICT PRIORITY
Potential overharvest of lake trout by anglers	Protect lean brood stocks	- implement season and catch restrictions when mature fish are vulnerable	High
	Inadequate information	- encourage the implementation of a monitoring programme to index the abundance of adult lake trout	High
	Increase stocking	- expand sport fish monitoring to include creel surveys during the open water season	Medium
		- continue to stock lake trout in areas where angling pressure is heavy to buffer pressure on native trout	Medium
		- allow the stocking of chinook salmon to direct pressure away from lake trout	Medium
Lake trout rehabilitation is not yet achieved	Protect lean brood stock	- encourage continued efforts to reduce sea lamprey populations to limit mortality of large lake trout	High
	Increase stocking	- stock in accordance with the Lake Superior Stocking and Assessment Plan to aid in the development of adult lake trout populations in areas where the population is below sustainable levels	High
Overharvest of any species by commercial fishermen	Law enforcement	- vigorously enforce conditions requiring compliance with commercial quotas	High
Present status of whitefish and lake herring stocks	Inadequate information	- request review of accumulated data base and development of recommendations by the Lake Superior Fisheries Unit	High
		- support/assist in the collection of additional resource information as required	Medium
Lack of information on rainbow trout, brook trout, walleye, northern pike	Inadequate information	- develop indices of species abundance and other pertinent data with assistance of volunteer angler co-operators	Low

IMPLEMENTATION SCHEDULE

In this section the specific tactics which:

1. are not part of routine day-to-day activities;
2. are the direct responsibility of the District;
3. are project or action oriented; and,
4. may be accomplished in the next 5 years,

have been brought together. The listing has been done to enable the public and fisheries staff to get an overview of these tactics which require conscious action to implement. In some cases the action can proceed without additional funds or staff, but to implement many of these tactics additional resources will be required.

The table does not include tactics which have been identified for implementation on Lake Superior. All the tactics outlined in the Lake Superior zone in the previous section are high priority and should be implemented in the next 5 years.

TABLE 4. IMPLEMENTATION SCHEDULE

TACTIC	EXISTING FUNDS	ADDITIONAL FUNDS
- Prepare District Enforcement Plan	x	
- Protect Walleye Brood Stocks - recommended lakes: Shebandowan Lake Lac des Mille Lacs	x	
- Implement Trophy Walleye Fishing Regulations - recommended lakes: Arrow Lake Cloud Lake Saganaga Lake Sandstone Lake		x
- Introduce Walleye to New Waters (1-2 lakes per year) - recommended lakes: Cheeseman Lake Edmundson Lake Gutteridge Lake Kekekuab Lake Keelor Lake Lower Kaogamok Lake McWhinney Lake Muskeg Lake Pace Lake Smiley Lake Tease Lake Upper Kaogamok Lake		x
- Survey Candidate Walleye Introduction Lakes - recommended lakes: See Appendix II		x
- Assess Success of Walleye Introductions (3-5 years after introduction)		x
- Conduct Creel Surveys on Indicator Lake Trout Lakes - recommended lakes: Abigogami Lake Burchell Lake Fallingsnow Lake Greenwater Lake Huronian Lake Innes Lake Oliver Lake Rudge Lake Walotka Lake		x
- Co-ordinate Management of Border Water Lake Trout Lakes with Minnesota	x	
- Conduct Lake Surveys on Unsurveyed Lake Trout Lakes		x

TABLE 4. (cont'd) - IMPLEMENTATION SCHEDULE

TACTIC	EXISTING FUNDS	ADDITIONAL FUNDS
- Assess the Results of Brook Trout Stocking Programme		x
- Conduct Lake and Stream Surveys on Unsurveyed Brook Trout Waters		x
- Conduct Stream Surveys to Locate New Waters for Brook Trout Introductions		x
- Stimulate C.F.I.P. Projects for Habitat Rehabilitation and Enhancement	x	
- Implement Special Regulations on Brook Trout Waters for:		
- recommended trophy fishing waters: Penassen Lake, Unknown Lake	x	
- recommended fly-fishing only waters: Pearl River		
- recommended winter season closures: Adrian Lake, Aldina Lake, Birch Lake, Cavern Lake, Fall Lake, Morrison Lake, Pocket Lake, Rock Lake, Shale Lake, Sunset Lake		
- Conduct Baitfish Management Workshops and Improve Administration	x	
- Establish Library of Baitfish Information		x
- Implement Trophy Pike Fishing Regulations		
- recommended lakes: Dog Lake, Legris Lake, Poshkokagan Lake, Vandenbrook Lake, Whitefin Lake		x
- Implement Planned Introduction of Additional Species as Warranted		
- recommended candidate species: Splake, Rainbow Trout, Brown Trout, Smallmouth Bass		x

TABLE 4 (cont'd) - IMPLEMENTATION SCHEDULE

TACTIC	EXISTING FUNDS	ADDITIONAL FUNDS
- Prepare Lake Specific Management Plans - recommended lakes in priority: Lac des Milles Lacs Dog Lake		x
- Encourage Use of Underutilized Species - prepare brochure on fishing techniques and location - conduct workshops and seminars - encourage media coverage of catch and use	x	
- Prepare Information Brochure on Undesirable Fish Introductions	x	
- Conduct Lake Surveys in Areas Slated to be Accessed by New Forest Access Roads		x
- Identify and Assess Sites where Habitat Deterioration has Occurred - recommended waters: Hawkeye Lake Loon Lake One Island Lake Shebandowan Lake Surprise Lake Trout Lake		x
- Negotiate Arrangement with Landowners to Allow Access and Habitat Improvement - recommended waters: Cedar Creek Corbett Creek Loch Lomond McVicar Creek Neebing River	x	
- Establish Volunteer Index Creel Surveys - recommended waters: Shebandowan Lake Lac des Milles Lacs Arrow Lake Northern Light Lake	x	

MANAGEMENT RESULTS

The preceding management programme appears very ambitious but with good reason. The conclusion that was reached in the Supply/Demand Analysis, that all the fisheries resources must be managed to their potential, has not been overlooked.

Implementation of the Plan will mean:

- the allowable harvest of lake trout from inland lakes can be achieved;
- the allowable harvest of brook trout will increase, possibly by up to 1,000 kilograms;
- the allowable harvest of walleye will increase by 28,000 kilograms, a 20% increase;
- the allowable harvests of smallmouth bass, northern pike and lake whitefish can be realized;
- the angler harvest from Lake Superior will increase to 90,000 kilograms per year.

The total effect is that by the year 2000, the allowable harvest by sport fishermen should be in excess of 600,000 kilograms per year, significantly closer to the target of 700,000 kilograms than is currently the case.

The effect of Plan implementation on the commercial fishery will likewise be positive. Their allowable harvest of lake trout should double and they will continue to benefit from the stability that will emerge as experience with individual quotas improves each fisherman's business decisions.

APPENDIX I

SUMMARY OF PUBLIC INPUT TO THE PRESENTATION OF BACKGROUND INFORMATION AND OPTIONAL MANAGEMENT STRATEGIES

In order to involve the public in the development of a Fisheries Management Plan for Thunder Bay District, open houses were held December 4 and 5, 1985. At that time the background information and optional management strategies relevant to the future management of fisheries in the District were presented for public review and comment.

A total of 92 sportfishing questionnaires and 45 detailed comment sheets and submissions were completed and returned to us. All the public input has been summarized, highlights of which are presented here for your information and continuing interest in the fisheries management planning process.

- There was general support for the background information presented concerning the fisheries resource and its users.
- There was strong support for the objectives, as stated, for fisheries management in the District.

Enhanced Management Opportunites

- good support for all five ideas presented with strongest support for the top three; managing certain lakes for trophy fish, fly-fishing only waters, splake stocking.

Problems and Issues - Optional Management Strategies

- most people felt that the list of identified problems and issues was complete. Suggested additions in the comments have all been included under the existing general headings (eg. recommended changes in winter seasons have been dealt with under overharvest of fish).

Those who replied ranked the problems and issues in order of importance:

Considered most important:

1. The Need for Specific Management Plans - specifically Dog Lake, Whitefish Lake, Lac des Mille Lacs, Canada-U.S. border waters, Arrow Lake, Shebandowan Lake, Sandstone Lake, Northern Light Lake, Kaministiquia River and others.
2. Overharvest of Fish - regarded as a prominent problem in lake trout and walleye populations, and to a lesser degree, brook trout.

   Strategies considered most important for preventing overharvest, in order:

   i) protect stocks when most vulnerable

   ii) special regulations to restrict harvest (lake specific)

   iii) improved assessment of causes of population decline

   iv) restrict/remove access on overharvested lakes

   v) increase number of lakes accessed to distribute pressure
3. Deterioration of Habitat - strong support for the use of public dollars for habitat rehabilitation, but those responsible for the problems should contribute.

Considered moderately important:

4. Underproducing Waters - very strong support for the walleye introductions programme. Introductions of other species were suggested (eg. smallmouth bass, brown trout).
5. Inadequate Information - respondents recognize the present lack of information and that there are many ways of gaining information concerning the resource and its users
6. User Group Competition - anglers recognize the existence of other users. Good support for allocating fish resources to specific users and acceptance of policies concerning access to tourism lakes.

Considered less important:

7. Underutilized Species - strong support for encouraging increased use of pike, perch, whitefish, etc., by residents through season and/or catch limit changes and particularly through public education.
8. Introduction of Undesirable Species - the use of smelt or perch as bait should be prohibited and enforced across the District to prevent introductions.

Additional Statements Commonly Noted by Respondents:

- In general, fishing in the Thunder Bay District is considered by most anglers to be adequate to good.
- Walleye continues to be the most sought after species in the District followed by lake trout and brook trout. (Rainbow trout, smallmouth bass, northern pike, and salmon are also popular).
- There is strong support for continuing the District adult walleye introductions programme.
- The brook trout stocking programme is well received and should continue.
- There is a recognized need for public education in order to encourage increased use of underutilized species by residents (eg. instruction on filleting pike).
- A salmon stocking programme for Lake Superior is desired by most anglers.
- Increased enforcement of fisheries regulations is needed.

- There is widespread support for winter closures of specific lakes and/or decreased winter seasons to reduce yearly harvests of lake trout and brook trout particularly. Otherwise current seasons and catch limits are judged to be about right.
- There is some feeling of resentment towards commercial fishing.
- Many respondents expressed support for continued involvement of public groups in fisheries improvement work through programmes such as the Community Fisheries Involvement Program (CFIP).

APPENDIX II

LAKES SCHEDULED FOR INTRODUCTION OF WALLEYE IN THE FIRST FIVE YEAR IMPLEMENTATION PERIOD (1986-1990) AND THOSE LAKES TO BE ASSESSED THAT HAVE THE POTENTIAL FOR WALLEYE INTRODUCTION IN THE PERIOD 1990-2000

A. WALLEYE INTRODUCTION LAKES 1986-1990 BY ZONE

ZONE NUMBER	WATERBODY	
3	Anders Lake	
4	Mawn Lake	Pace Lake
	Keelor Lake	Smiley Lake
	Tease Lake	Muskeg Lake
	Cheeseman Lake	
7	Kekekuab Lake	
	Bedivere Lake (partial introduction in 1982)	

B. LAKES TO BE ASSESSED FOR WALLEYE INTRODUCTION 1986-1990

ZONE NUMBER	WATERBODY	
4	McWhinney Lake	Cowan Lake
	Edmondson Lake	Sharpe Lake
	Gutteridge Lake	Lower Kaogomok Lake
	Eayres Lake	Upper Kaogomok Lake

C. LAKES SCHEDULED FOR ASSESSMENT AND POSSIBLE INTRODUCTION OF WALLEYE 1990-2000

ZONE NUMBER	WATERBODY	
1	None	
2	None	
3	Wolfpup Lake Seagull Lake Beatty Lake	Hicky Lake Upper Wolf Lake
4	Current Lake Steepledge Lake Escape Lake Fitzpatrick Lake Ray Lake Crock Lake Spirit Lake Monday Lake Odette Lake Geikie Lake	Swallownest Lake Kingstone Lake Mirage Lake Ricestalk Lake Wabikon Lake Wabiko Lake Gennis Lake Upper Wabikon Lake Cantrill Lake
5	None	
6	Sleigh Lake Greenwood Lake Melvin Lake	Beulah Lake Laughren Lake 2 nameless lakes north and west of Melvin Lake
7	Fortune Lake Fire Lake Mason Lake Young Lake Blossom Lake Cascade Lake Chain of lakes NE of Sabrina Lake 2 nameless lakes NE of Titmarsh Lake	Whalen Lake Carson Lake Murphy Lake Upper Sabrina Lake Argon Lake Pinecone Lake
8	None	
9	None	

APPENDIX III

PRIME LAKE TROUT LAKES AS IDENTIFIED IN THE THUNDER BAY DISTRICT LAND USE GUIDELINES

Definition:

Prime lake trout lakes are lakes in which the fisheries resource will be managed to sustain the lake trout population as a primary component of the fish community.

The following list of lakes are identified prime lake trout lakes.

Abigogami	Little North	Tinto
Arrow	Loch Erne	Titmarsh
Athelstane	Loch Lomond	Twinhouse
Atik	MacIntosh	Uneven
Baril	Miner	Voltaire
Burchell	Mooseland	Wabindon
Burnt Island	Moraine	Watershed
Camp (Little Kashabowie)	Mowe	Windigoostigwan
Dakota	Myrt	Wye
East Plummes	North	Yellowhammer
Elevation	North Mawn	Gneiss
Fallingsnow	Northern Light	Gunflint
Fork	Oliver	Little Gunflint
Greenwater	Partridge	Little Trout
Greenwich	Redfox	Magnetic
Grouse	Ross	Moose
Gunter	Rudge	Mountain
Home	Sanctuary	Ojala
Hood	Sandstone	Rose
Huronian	Silver (Sheen)	Saganaga
Icarus	Squeers	Scarp
Innes	Stetham	South
Kamikau	Sunbow	Sunbeam
Lac des Iles	Sunset	Tilly
Little Moraine	Trout (near Bemar)	Walotka

Total number of identified prime lake trout lakes - 75

APPENDIX IV

STOCKED BROOK TROUT LAKES IN THUNDER BAY DISTRICT
LISTED BY ZONE

ZONE NUMBER	WATERBODY		
1	Black Lake	Sunset Lake	Bell Lake
	Adrian Lake	Matson Lake	Jinx Lake East
	Gordon Lake	McKecknie Lake	Joan Lake
	Gold Lake	Lizard Lake	Morrison Lake
	Pothole Lake	Marks Lake	10 Minute Lake
	Ranger Lake	Devonline Lake	Lismore #1 Lake
	Devon Lake	Eye Lake	Hartington #1 Lake
	Float Lake	Echo (Strange)	Hartington #2 Lake
	Downy Lake	West Pennock Lake	East Pennock Lake
	Lismore #2 Lake	Rock Lake	Hartington #3 Lake
	Birch Lake	Karila Lake	Castle Lake South
	Forest Lake	Chub Lake	
	Stephens Lake (Splake)		
2	Golding Lake	Lower Hawkeye Lake	
3	Cavern Lake	Melvin Lake	Falls Lake
	Bisect Lake	Gulch Lake	Upper Hunter Lake
	Shale Lake	Lower Hunter Lake	Pocket Lake
	Elbow Lake	Unknown Lake	Tartan Lake
	MacDonald W Lake	Paradise Lake	Lost Lake
	Furcate Lake	Wiggins Lake	Five Minute Lake
	Himdick Lake	Miner Lake	Sunset Lake
	Nolan Lake	Long Lake	Clegge Lake
	Bigger Lake	MacIntosh Lake	Moose Lake
	Hilma Lake	Mutt Lake	Wideman Lake
	Jeff Lake	Nalla Lake	Young Lake
	Lake #19	Waller Lake	Liver Lake
	Kallio Lake	Penassen #1 Lake	Penassen #2 Lake
	Penassen #3 Lake	Penassen #4 Lake	Sigh Lake (Splake)
4	None		
5	None		
6	Tilly Creek	Scott Lake	Wasp Lake
	Elbow Lake	Little Round Lake	Addie Lake South
	West Arrow Lake	Little Arrow Lake	
7	Inwood Lake	Tear Drop Lake	Sitch Lake
	Andy Lake	Rainbow Lake	Loch Muich
	Sunshine Creek	Wiegand River	Aldina Lake
	Oskandaga Lake	Head Lake	Lauries Lake #1
	Lauries Lake #2	Lauries Lake #3	Lauries Lake #4
	Little Head Lake	Sand Lake North	
8	None		
9	None		

APPENDIX V

TOURISM LAKES AS IDENTIFIED IN THE
THUNDER BAY DISTRICT LAND USE GUIDELINES AND THE
DISTRICT FISHERIES MANAGEMENT PLAN

Definition (from DLUG):

Tourism lakes are lakes selected to provide opportunities primarily for commercial tourism, development such as lodges, outpost camps, etc. These lakes will be managed according to the access roads and the modified management areas policies.

The following list of lakes are identified tourism lakes:

Clay and Powell Lake
Legris Lake
Gridiron Lake
Sassafras Lake
Rude Lake
Survey Lake
Hilltop Lake
Holinshead Lake
Pyramid Lake
Kearns Lake
Holly Lake
Bishop Lake
Gillard Lake
Dora Lake
Stonehouse Lake
Tommyhow Lake
Whitebirch Lake
Mountairy Lake
McGuinness Lake
Moss Lake
Grew Lake
Loganberry Lake
Mosher Lake

The above lakes are considered remote tourism lakes with no road access.

Additional road-accessible waterbodies on which tourism facilities are located:

Arrow Lake
Dog Lake
English River
Kabitotikwia Lake
Kashabowie Lake
Lac des Mille Lacs
Northern Light Lake
Pakashkan Lake
Pine Bay (Lake Superior)
Saganaga Lake
Sandstone Lake
Shebandowan Lake
Silver (Sheen) Lake
Weikwabinonaw Lake
Whitefish Lake